

7

5-in-1

SCIENCE

I TERM

Unit

1

Measurement

Evaluation

I. Choose the appropriate answer.

1. Which of the following is a derived unit?

- a) mass
b) time
c) area
d) length

Ans: c) area

2. Which of the following is correct?

- a) 1L = 1 cc
b) 1L = 10 cc
c) 1L = 100 cc
d) 1L = 1000 cc

Ans: d) 1L = 1000 cc

3. SI unit of density is _____.

- a) Kg/m^2
b) Kg/m^3
c) Kg/m
d) g/m^3

Ans: b) Kg/m^3

4. Two spheres have equal mass and volume in the ratio 2:1. The ratio mass of their density is _____.

- a) 1:2
b) 2:1
c) 4:1
d) 1:4

Ans: b) 2:1

5. Light year is the unit of?

- a) Distance
b) Time
c) Density
d) Both length and time

Ans: a) Distance

II. Fill in the blanks.

1. Volume of irregularly shaped objects are measures using the law of _____.

Ans: buoyancy

2. One cubic meter is equal to _____ cubic centimetre.

Ans: 1000000

3. Density of mercury is _____.

Ans: $13,600 \text{ kg/m}^3$

4. One astronomical unit is equal to _____.

Ans: $1.496 \times 10^{11} \text{m}$

5. The area of a leaf can be measures using a _____.

Ans: graph sheet



III. State true or false. If false, correct the statement.

- The region covered by the boundary of the plane figure is called its volume. **Ans: False**
Correct Statement: The region covered by the boundary of plane figure is called its area.
- Volume of liquids can be found using measuring containers. **Ans: True**
- Water is denser than kerosene. **Ans: True**
- A ball of iron floats in mercury. **Ans: True**
- A Substance which contains less number of molecules per unit volume is said to be denser. **Ans: False**
Correct Statement: A substance which contains more number of molecules per unit volume is said to be denser.

IV. Match the items in column-I to the items in column-II.

1.	Column - I		Column - II
i.	Area	-	(a) light year
ii.	Distance	-	(b) m^3
iii.	Density	-	(c) m^2
iv.	Volume	-	(d) Kg
v.	Mass	-	(e) Kg / m^3

Ans: i.c ii.a iii.e iv.b v.d

2.	Column - I		Column - II
i.	Area	-	(a) g / cm^3
ii.	Distance	-	(b) Measuring jar
iii.	Density	-	(c) amount of a substance
iv.	Volume	-	(d) rope
v.	Mass	-	(e) plane figures

Ans: i.e ii.d iii.a iv.b v.c

V. Arrange the following in correct sequence.

1. **1L, 100 cc, 10L, 10 cc**

Ans: 10 cc, 100 cc, 1L, 100L

2. **Copper, Aluminium, Gold, Iron**

Ans: Aluminium, Iron, Copper, Gold

VI. Use the analogy to fill in the balnk.

- Area : m^2 :: Volume : _____ **Ans: m^3**
- Liquid : Litre :: Solid : _____ **Ans: m^3**
- Water : Kerosene :: _____ : Aluminium. **Ans: Iron**

VII. Consider the following statements and choose the correct option.

- Both assertion and reason are true and reason is the correct explanation of assertion.
- Both assertion and reason are true, but reason is not the correct explanation of assertion.
- Assertion is true but reason is false.
- Assertion is false but reason is true.

1. **Assertion** : Volume of a stone is found using a measuring cylinder.

Reason : Stone is an irregularly shaped object.

Ans: (a)

2. **Assertion** : Woods float in water.

Reason : Water is a transparent liquid.

Ans: (b)

3. **Assertion** : Iron ball sinks in water

Reason : water is denser than iron.

Ans: (b)

VIII. Answer very briefly.

1. **Name some of the derived quantities.**

Some of the derived quantities are area, volume, speed and density.

2. **Given the value of one light year.**

1 light year = 9.46×10^{15} m.

3. **Write down the formula used to find the volume of a cylinder.**

Volume of a cylinder = $\pi r^2 h$

4. **Give the formula to find the density of objects.**

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

5. **Name the liquid in which an iron ball sinks.**

Water.

6. **Name the units used to measure the distance between celestial objects.**

❖ Astronomical unit

❖ Light year

7. **What is the density of gold?**

Density of gold = $19,300 \text{ kg/m}^3$

IX. Answer briefly:

1. **What are derived quantities?**

Physical quantities which can be obtained by multiplying, dividing or by mathematically combining the fundamental quantities are known as derived quantities.

2. Distinguish between the volume of liquid and capacity of a container.

Volume of a liquid	Capacity of a container
The volume of a liquid is equal to the space that it fills.	The capacity of a container is the maximum volume of liquid that a container can hold.

3. Define the density of objects.

Density of a substance is defined as the mass of the substance contain in unit volume.

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

4. What is one light year?

One light year is defined as the distance travelled by light in vacuum during the period of one year.

$$1 \text{ Light year} = 9.46 \times 10^{15} \text{ m.}$$

5. Define - Astronomical unit.

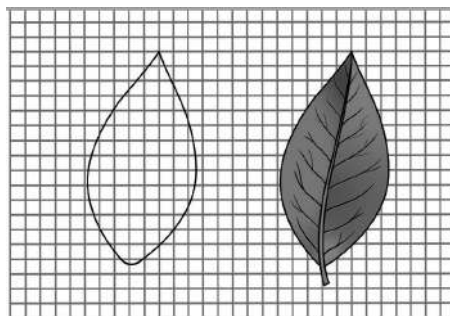
One astronomical unit is defined as the average distance between the earth and the sun.

$$1 \text{ AU} = 1.496 \times 10^{11} \text{ m}$$

X. Answer in detail.

1. Describe the graphical method to find the area of an irregularly shaped plane figure.

- ❖ Take a leaf and place it on a graph sheet.
- ❖ Draw the outline of the leaf with a pencil and remove the leaf.
- ❖ You can see the outline of the leaf. On the graph sheet.
- ❖ Now count the number of whole squares enclosed within the outline of the leaf. Take it to be M.
- ❖ Then count the number of squared that are more than half. Take it as N.
- ❖ Next count the number of squares which are half of a whole square. Note it to be P.
- ❖ Finally count the number of squares that are less than half. Let it be (i).
- ❖ $M = 50$ $N = 7$ $P = 4$ $Q = 4$
- ❖ Approximate area of the leaf,



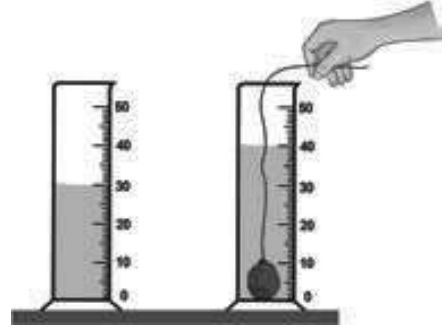
$$\text{Approximate area of the leaf} = M + \left(\frac{3}{4}\right) N + \left(\frac{1}{2}\right) P + \left(\frac{1}{4}\right) Q$$

$$= 50 + \left(\frac{3}{4}\right) \times 7 + \left(\frac{1}{2} \times 4\right) + \left(\frac{1}{4} \times 4\right)$$

$$\begin{aligned}
 &= 50 + \frac{21}{4} + 2 + 1 = 50 + 5.25 + 2 + 1 \\
 &= 58.25 \text{ sq. mm} = 0.5825 \text{ sq. cm}
 \end{aligned}$$

2. How will you determine the density of a stone using a measuring jar?

- ❖ Take a measuring cylinder and pour some water into it. Do not fill the cylinder completely.
- ❖ Note down the volume of water from the readings of the measuring cylinder. Take it as V_1 .
- ❖ Now take a small stone and tie it with a thread.
- ❖ Immerse the stone inside the water by holding the thread such that the stone does not touch the walls of the measuring cylinder.
- ❖ Now the level of water has raised. Note the volume of water and take it to be V_2 .
- ❖ The volume of the stone is equal to the rise in the volume of water.
- ❖ $V_1 = \dots\dots\dots$ $V_2 = \dots\dots\dots$ $\therefore$ Volume of stone (V) = $V_2 - V_1$.
- ❖ Then measure the mass of the stone using a spring balance. Take it as M .



Volume of an irregularly shaped object

$$\text{Density of the stone} = \frac{\text{Mass}}{\text{Volume}}$$

XI. Questions based on Higher Order Thinking skills.

1. There are three spheres A, B, C as shown below:



Sphere A and B are made of same material. Sphere C is made of a different material. Spheres A and C have equal radii. The radius of sphere B is half that of A. Density of A is double that of C.

Now answer the following questions:

- i. Find the ratio of masses of spheres A and B.

$$\text{Mass A : Mass B}$$

$$M_A : M_B$$

$$\begin{aligned}
 \cancel{D_A} \times V_A : \cancel{D_B} \times V_B & \quad [\because D_A = D_B] \\
 V_A : V_B & \longrightarrow \frac{4}{3}\pi r_A^3 : \frac{4}{3}\pi r_B^3
 \end{aligned}$$

$$r_A^3 : \left(\frac{1}{2}r_A\right)^3 \quad \left[\because r_B = \frac{1}{2}r_A \right]$$

$$\cancel{r_A^3} : \frac{1}{8}\cancel{r_A^3}$$

$$1 : \frac{1}{8}$$

$$8 : 1$$

Ratio of masses of spheres A and B = 8:1

ii. Find the ratio of volumes of spheres A and B.

$$V_A : V_B$$

$$\frac{4}{3}\pi r_A^3 : \frac{4}{3}\pi r_B^3$$

$$r_A^3 : r_B^3$$

$$\left[r_B = \frac{1}{2}r_A \right]$$

$$r_A^3 : \left(\frac{1}{2}r_A\right)^3$$

$$\cancel{r_A^3} : \frac{1}{8}\cancel{r_A^3}$$

$$1 : \frac{1}{8}$$

$$8 : 1$$

Ratio of volume of spheres A and B = 8:1

iii. Find the ratio of masses of spheres A and C.

$$M_A : M_C$$

$$D_A \times \cancel{V_A} : D_C \times \cancel{V_C} \quad [V_A = V_C]$$

$$D_A : D_C$$

Since density of A is double that of C,

$$2\cancel{D_C} : \cancel{D_C}$$

$$2 : 1$$

Ratio of masses of spheres A and B = 2:1

XII. Numerical problems.

1. A circular disc has a radius 10 cm. Find the area of the disc in m^2 .
(Use $\pi = 3.14$).

Solution:

$$\text{Area of a circle } A = \pi r^2 = 3.14 \times 0.1 \times 0.1$$

$$\text{Area of the circular disc} = 3.14 \, m^2$$



2. The dimension of a school playground is 800 m × 500 m. Find the area of the ground.

$$\begin{aligned}\text{Area of the ground} &= l \times b \\ &= 800 \times 500 \\ &= 400000m^2\end{aligned}$$

$$\text{Area of the ground} = 4,00,000 \text{ m}^2$$

3. Two spheres of same size are made from copper and iron respectively. Find the ratio between their masses. Density of copper 8,900 kg/m³ and iron 7,800 kg/m³.

$$\text{Density of copper } (d_1) = 8900 \text{ kg / m}^3$$

$$\text{Density of Iron } (d_2) = 7800 \text{ kg / m}^3$$

$$V_1 = V_2$$

$$M = d \times v$$

$$\text{Ratio of masses} = M_1 : M_2 = ?$$

$$M_1 : M_2$$

$$d_1 \times \cancel{V_1} = d_2 \times \cancel{V_2}$$

$$89,00 \cancel{\cancel{0}} : 78,00 \cancel{\cancel{0}}$$

$$\therefore \text{Ratio of masses} = 89 : 78$$

4. A liquid having a mass of 250 g fills a space of 1000 cc. Find the density of the liquid.

$$\text{Mass } (m) = 250g$$

$$\text{Volume } (v) = 1000cc$$

$$\begin{aligned}\therefore \text{Density} &= \frac{\text{Mass}}{\text{Volume}} \\ &= \frac{250}{1000} = 0.25\end{aligned}$$

$$\text{Density} = 0.25g/cc$$

5. A sphere of radius 1cm is made from silver. If the mass of the sphere is 33g, find the density of silver. (Take $\pi = 3.14$).

$$\text{Radius of the sphere } (r) = 1cm$$

$$\begin{aligned}\text{Volume of the sphere} &= \frac{4}{3} \pi r^3 \\ &= \frac{4}{3} \times 3.14 \times 1 \times 1 \times 1\end{aligned}$$

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}} = \frac{33}{4.18} = 7.89g / cc$$

XIII. Cross word puzzle:

	(1) K	E	L	(a) V	I	N					
				E							
	(d) L			L		(B) C					(C) M
	I		(2) V	O	L	U	M	E			E
	G			C		B					R
	H			I		I					C
	T			T		C					U
	Y			Y		M					R
	E				(3) D	E	N	S	I	T	Y
(4) C	A	P	A	C	I	T	Y				
	R					R					
						E					

CLUES – ACROSS

1. SI unit of temperature - Kelvin
2. A derived quantity - Volume
3. Mass per unit volume - Density
4. Maximum volume of liquid a container can hold - Capacity

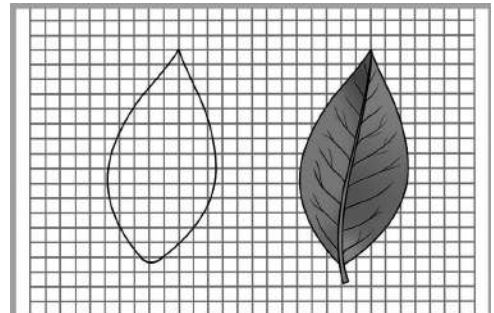
CLUES – DOWN

- a. A derived quantity - Velocity
- b. SI unit of volume - Cubic metre
- c. A liquid denser than iron - Mercury
- d. A unit of length used to measure very long distances - Lightyear

Activity 1

Take a leaf from any one of the trees. Place it on a graph sheet and draw the outline of the leaf with a pencil. Remove the leaf. You can see the outline of the leaf on the graph sheet.

- i. Now, count the number of whole squares enclosed within the outline of the leaf. Take it as M.
- ii. Then, count the number of squares that are more than half. Take it as N.
- iii. Next, count the number of squares which are half of a whole square. Note it to be P.



iv. Finally, count the number of squares that are less than half. Let it be Q.

v. $M = 50$; $N = 7$;

$P = 4$; $Q = 4$

Now, the approximate area of the leaf can be calculated using the following formula:

Approximate area of the leaf = $M + \left(\frac{3}{4}\right) N + \left(\frac{1}{2}\right) P + \left(\frac{1}{4}\right) Q$ square cm.

Area of the leaf = 0.5825 cm².

Solution:

$$\begin{aligned}
 \text{Approximate area of the leaf} &= M + \left(\frac{3}{4}\right) N + \left(\frac{1}{2}\right) P + \left(\frac{1}{4}\right) Q \\
 &= 50 + \left(\frac{3}{4}\right) \times 7 + \left(\frac{1}{2} \times \cancel{4}\right) + \left(\frac{1}{4} \times \cancel{4}\right) \\
 &= 50 + \frac{21}{4} + 2 + 1 = 50 + 5.25 + 2 + 1 \\
 &= 58.25 \text{ sq. mm} = 0.5825 \text{ sq.cm}
 \end{aligned}$$

Activity 2

Draw the following regularly shaped figures on a graph sheet and find their area by the graphical method. Also, find their area using appropriate formula. Compare the results obtained in two methods by tabulating them.

- A rectangle whose length is 12 cm and breadth is 4 cm.
- A square whose side is 6 cm.
- A circle whose radius is 7 cm.
- A triangle whose base is 6 cm and height is 8 cm.

S. No.	Shape	Area using formula	Area using graphical method
1.	Rectangle	$A = l \times b = 12 \times 4 = 48 \text{ sq.cm}$	48 sq.cm
2.	Square	$A = s \times s = 6 \times 6 = 36 \text{ sq.cm}$	36 sq.cm
3.	Circle	$A = r^2 = \frac{22}{7} \times \cancel{7} \times 7 = 154 \text{ sq.cm}$	154 sq.cm
4.	Triangle	$\frac{1}{2} \times b \times h = \frac{1}{2} \times \cancel{6}^3 \times 8 = 24 \text{ sq.cm}$	24 sq.cm

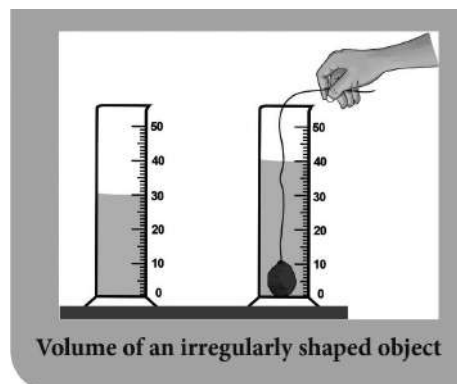
Activity 3

Take a measuring cylinder and pour some water into it (Do not fill the cylinder completely). Note down the volume of water from the readings of the measuring cylinder. Take it as V_1 . Now take a small stone and tie it with a thread. Immerse the stone inside the water by holding the thread. This has to be done such that the stone does not touch the walls of the measuring cylinder. Now, the level of water has raised. Note down the volume of water and take it as V_2 . The volume of the stone is equal to the raise in the volume of water.

$$\text{Volume of Stone} = V_2 - V_1$$

$$V_1 = 30\text{cc}; V_2 = 40\text{cc};$$

$$\text{Volume of stone} = V_2 - V_1 = 40\text{cc} - 30\text{cc} = 10\text{cc}$$



Activity 4

- (a) Take an iron block and a wooden block of same mass (say 1 kg each). Measure their volume. Which one of them has more volume and occupies more volume?

Wooden block has more volume and occupies more volume. (As the molecules of wood are loosely packed)

- (b) Take an iron block and a wooden block of same size. Weigh them and measure their mass. Which one of them has more mass?

Iron block has more mass. (In iron block, molecules are closely packed).

Additional Questions

I. Choose the appropriate answer.

1. Volume of a sphere _____.

a) $\pi r^2 h$

b) lbh

c) $\frac{4}{3} \pi r^3$

d) a^3

Ans: c) $\frac{4}{3} \pi r^3$

2. Density of water is _____ kg/m^3 .

a) 800

b) 1000

c) 2700

d) 7800

Ans: b) 1000

3. _____ is not a fundamental quantity.

- a) Length b) Mass
c) Time d) Volume

Ans: d) Volume

II. Fill in the blanks.

1. The average distance between the sun and the earth is about _____ km.

Ans: 149.6 million

2. 1 gallon = _____ ml.

Ans: 3785

3. SI unit of electric charge is _____.

Ans: Coulomb

III. State whether the following statements are true or false.

1. The CGS unit of density is kg/m^3 .

Ans: False

Correct Statement : The CGS unit of density is g/cm^3

2. The nearest star to our solar system is Proxima Centuari.

Ans: True

3. The SI unit of electric current is Volt.

Ans: False

Correct Statement : The SI unit of electric current is Ampere.

IV. Match the items in column-I to the items in column-II.

	Column - I		Column - II
1.	Mass	-	a) distance / time
2.	Area	-	b) $1.496 \times 10^{11} \text{ m}$
3.	Speed	-	c) 30 ml
4.	1 Ounce	-	d) Density $\times$ Volume
5.	1 AU	-	e) Length $\times$ Breadth

Ans: 1.d 2.e 3.a 4.c 5.b

V. Answer Briefly.

1. What are called fundamental quantities?

A set of physical quantities which cannot be expressed in terms of any other quantities are known as fundamental quantities.

Eg: length, mass, time.

2. Define: Area.

- ❖ Area of a figure is the region covered by the boundary of the figure.
- ❖ SI unit of area is m^2 .

3. Tabulate the fundamental quantities and their units.

S.No.	Fundamental quantity	Fundamental unit
1.	Length	Meter (m)
2.	Mass	Kilogram (kg)
3.	Time	Second (s)
4.	Temperature	Kelvin (K)
5.	Electric current	Ampere (A)
6.	Amount of substance	Mole (mol)
7.	Luminous intensity	Candela (cd)

4. What are called denser and rarer materials?

The materials with higher density are called "denser" and the materials with lower density are called "rarer".

**Formative Assessment - 1**

Time: 15 mins.

Marks: 10

I. Choose the best answer.**3×1=3**

- SI unit of density is _____.
a) kh/m b) kg/m² c) kg/m³ d) g/m³
- Which of the following is a derived quantity _____.
a) Mass b) Time c) Length d) Area
- Volume of a sphere is _____.
a) $\frac{4}{3}\pi r^3$ b) $\frac{1}{3}\pi r^2 h$ c) lbh d) a³

II. Fill in the blanks.**3×1=3**

- Density of a mercury is _____.
- Area of a leaf can be measured using a _____.
- SI unit of electric charge is _____.

III. Match the following.**4×1=4**

- | | | |
|------------|---|--------------------------|
| 1. Area | - | a) g/m ³ |
| 2. Density | - | b) measuring jar |
| 3. Volume | - | c) amount of a substance |
| 4. Mass | - | d) plane figures |



Unit

2

Force and Motion

Evaluation

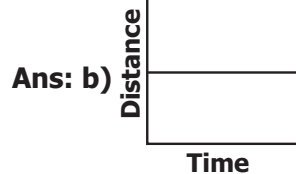
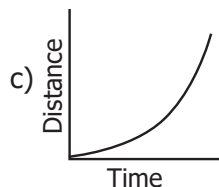
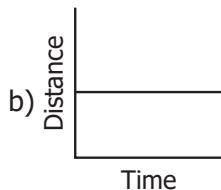
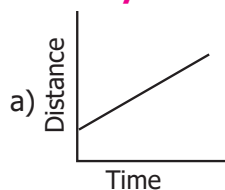
I. Choose the appropriate answer.

1. A particle is moving in a circular path of radius r . The displacement after half a circle would be _____.

a) Zero

b) R c) $2r$ d) $r/2$ Ans: c) $2r$

2. Which of the following figures represent uniform motion of a moving object correctly?



3. From the given v-t graph it can be inferred that the object is _____.

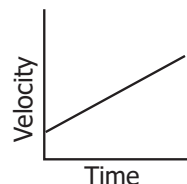
a) in uniform motion

b) at rest

c) in non uniform motion

d) moving with uniform acceleration

Ans: d) moving with uniform acceleration



4. Suppose a boy is enjoying a ride on a merry go round which is moving with a constant speed of 10 m/s. It implies that the boy is _____.

a) at rest

b) moving with no acceleration

c) in accelerated motion

d) moving with uniform velocity

Ans: c) in accelerated motion





5. How can we increase the stability of an object?

- Lowering the centre of gravity
- Raising the centre of gravity
- Increasing the height of the object
- Shortening the base of the object

Ans: a) Lowering the centre of gravity

II. Fill in the blanks.

- The shortest distance between the two places is _____. **Ans: displacement**
- The rate of change of velocity is _____. **Ans: acceleration**
- If the velocity of an object increases with respect to time, then the object is said to be in _____ acceleration. **Ans: positive**
- The slope of the speed–time graph gives _____. **Ans: acceleration**
- In _____ equilibrium, the centre of gravity remains at the same height when it is displaced. **Ans: neutral**

III. Match the following.

- | | | |
|---|-----------------------|---------------------------------|
| 1. Displacement | - a) Knot | |
| 2. Light travels through vacuum | - b) Geometric centre | |
| 3. Speed of ship | - c) Metre | |
| 4. Centre of gravity of the geometrical shaped object | - d) Larger base area | |
| 5. Stability | - e) Uniform velocity | Ans: 1.c 2.e 3.a 4.b 5.d |

IV. Analogy.

- Velocity : metre/second : : Acceleration : _____. **Ans: metre/second²**
- Length of scale : metre : : Speed of aeroplane : _____. **Ans: Knot**
- Displacement/Time : Velocity : : Speed/Time : _____. **Ans: acceleration**

V. Answer very briefly.

- All objects having uniform speed need not have uniform velocity. Give reason.**
 - ❖ If a vehicle moving in a circular path with uniform speed, then its velocity is said to be non uniform, because on a circular path, the direction of a moving body changes.
 - ❖ If a vehicle moving with uniform speed on a zig zag path, the velocity of a vehicle will be non uniform because direction of vehicle is changed.
- A girl moves at a constant speed in the same direction. Rephrase the same sentence in fewer words using concepts related to motion.**
A girl moves at a straight line with constant velocity.

3. **Correct your friend who says that acceleration gives the idea of how fast the position changes.**

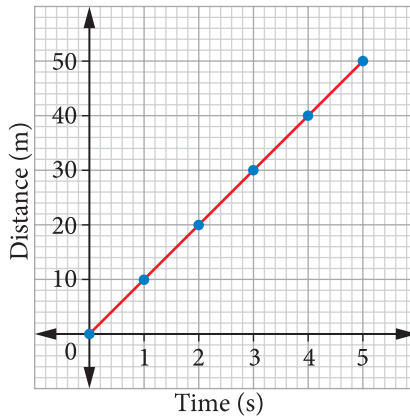
Acceleration gives the idea of how fast the direction changes.

VI. Answer briefly.

1. **Show the shape of the distance – time graph for the motion in the following cases.**

- a. **A bus moving with a constant speed.**

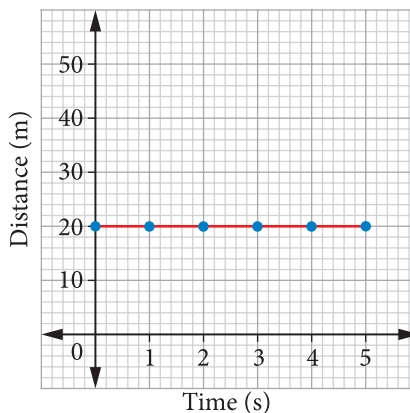
Time (s)	0	1	2	3	4	5
Distance (m)	0	10	20	30	40	50



The graph has a zero constant gradient.
The distance increases 10 m every second.

- b. **A car parked on a road side.**

Time (s)	0	1	2	3	4	5
Distance (m)	0	20	20	20	20	20



The graph has zero gradient.
The distance is a constant for every second.

2. Distinguish between speed and velocity.

S.No	Speed	Velocity
1.	Speed is the rate of change of distance.	Velocity is the rate of change in displacement.
2.	$\text{Speed} = \frac{\text{distance}}{\text{time}}$	$\text{velocity} = \frac{\text{displacement}}{\text{time}}$

3. What do you mean by constant acceleration?

An object undergoes constant acceleration when the change in its velocity for every unit of time is the same.

4. What is centre of gravity?

The centre of gravity of an object is the point through which the entire weight of the object appears to act.

VII. Answer in detail.

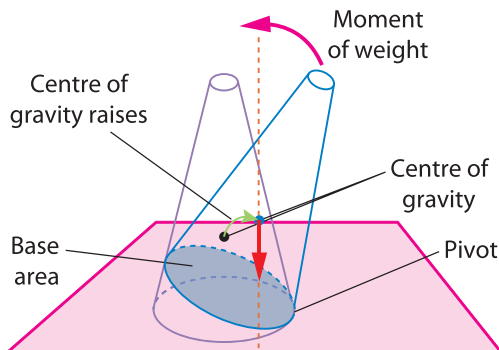
1. Explain the types of stability with suitable examples.

The three types of stability are,

- ❖ Stable equilibrium
- ❖ Unstable equilibrium
- ❖ Neutral equilibrium

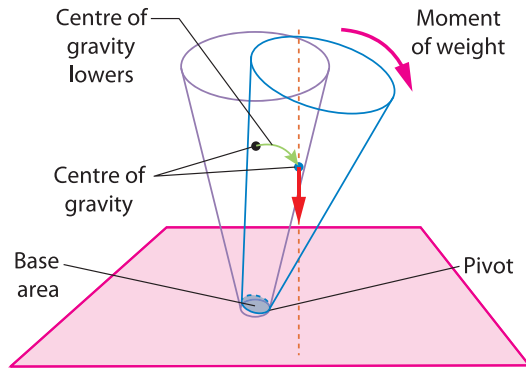
1. Stable equilibrium:

- ❖ The frustum can be tilted through quite a big angle without toppling.
- ❖ Its centre of gravity is raised when it is displaced.
- ❖ The vertical line through its centre of gravity still falls within its base.
- ❖ So it can return to its original position.

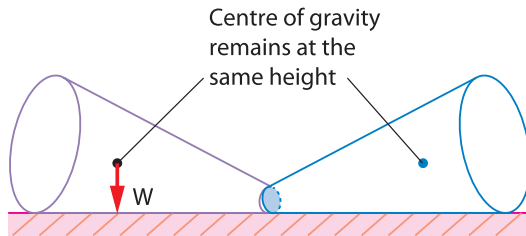


2. Unstable equilibrium:

- ❖ The frustum will topple with the slightest tilting.
- ❖ Its centre of gravity is lowered when it is displaced.



- ❖ The vertical line through its centre of gravity falls outside its base.
- ❖ Eg:

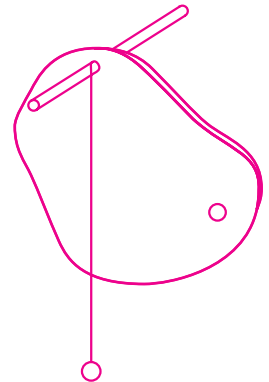


3. Neutral equilibrium:

- ❖ It causes frustum to topple. The frustum will roll about but does not topple.
- ❖ Its centre of gravity remains at the same height when it is displaced.
- ❖ The body will stay in any position to which it has been displaced.

2. Write about the experiment to find the centre of gravity of the irregularly shaped plate.

- ❖ Make three holes in the irregular shaped plate.
- ❖ Suspend the plate from the optical pin through one of the holes as shown in the figure.
- ❖ Suspend the plumbline from the pin and mark the position of the plumbline on the plate.
- ❖ Draw lines on the plate representing the position of the plumbline.
- ❖ Repeat the above steps for the other holes.
- ❖ Label the intersection of the three lines as X, the position of the centre of gravity of the irregularly shaped plate.



VIII. Numerical problems.

1. Geetha takes 15 minutes from her house to reach her school on a bicycle. If the bicycle has a speed of 2 m/s, calculate the distance between her house and the school.

$$\text{Time} = 15 \text{ minutes} = 900 \text{ Sec}$$

$$\text{Speed} = 2 \text{ m / s}$$

$$\text{Speed} = \frac{\text{distance}}{\text{Time}}$$

$$\text{Distance} = \text{Speed} \times \text{time}$$

$$\text{Distance} = 2 \times 900 = 1800 \text{ m}$$

$$\text{Distance} = 1800 \text{ m}$$

2. A car started from rest and travelling with velocity of 20 m/s in 10 s. What is its acceleration?

$$\text{Initial velocity (} u \text{)} = 0 \text{ m / s}$$

$$\text{Final velocity (} v \text{)} = 20 \text{ m / s}$$

$$\text{Time (} t \text{)} = 10 \text{ s}$$

$$\begin{aligned} \text{Acceleration} &= \frac{v - u}{t} \\ &= \frac{20 - 0}{10} \\ &= \frac{20}{10} = 2 \text{ m / s}^2 \end{aligned}$$

$$\text{Acceleration} = 2 \text{ m / s}^2$$

3. A bus can accelerate with an acceleration 1 m/s². Find the minimum time for the bus to reach the speed of 100 km/s from 50 km/s.

$$\text{Acceleration (} a \text{)} = 1 \text{ m / s}^2$$

$$\text{Initial velocity (} u \text{)} = 50 \text{ km / s} = 50,000 \text{ m / s}$$

$$\text{Final velocity (} v \text{)} = 100 \text{ km / s} = 100,000 \text{ m / s}$$

$$\text{Time} = ?$$

$$\begin{aligned} a &= \frac{(v - u)}{t} \\ 1 &= \frac{100,000 - 50,000}{t} \\ t &= 50,000 \text{ seconds} \end{aligned}$$

IX. Fill in the boxes.

S.No.	First Move	Second Move	Distance (m)	Displacement
1.	Move 4 meters east	Move 2 meters west	6	2m east
2.	Move 4 meters north	Move 2 meters south	6	2m north
3.	Move 2 meters east	Move 4 meters west	6	2m west

4.	Move 5 meters east	Move 5 meters west	10	0 (same place)
5.	Move 5 meters south	Move 2 meters north	7	3m south
6.	Move 10 meters west	Move 3 meters east	13	7m west

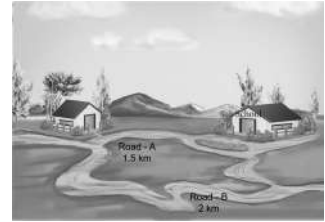
Activities

- As shown in the picture, Kavitha can reach her school in two ways. Can you tell, by choosing which path she could reach the school early.

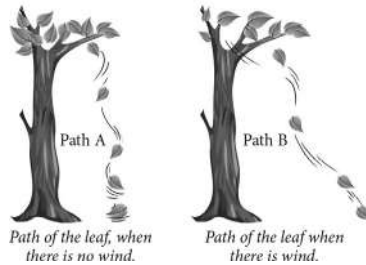
Road A

Road B

By choosing road A Kavitha could reach the school early as the distance is less compared to road B.



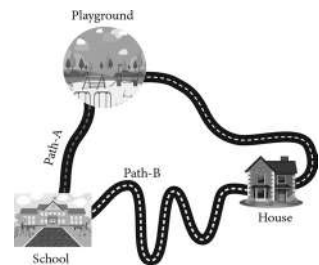
- Look at the below picture.



In which path the leaf will reach the ground first?

The leaf will reach the ground first by path - A, as it reaches the ground in a straight line.

- Uma and Priya are friends studying in the same school. After school hours, they go to the nearby playground, play games and return back home. One day Uma told that she would reach the playground after visiting her grandmother's house. The path in which they took reached the playground is shown here.



Take a twine and measure the length of the two paths (A & B).

Which is the longest path among the two?

Path A is the longest among the two. As it is not a straight line.

- The path in which a rabbit ran is shown in figure. Let us consider that each square is in an unit of one square meter. The rabbit starts from point A and reaches the point B. Find the distance and displacement of it in the two figures. When will the distance and displacement be equal?

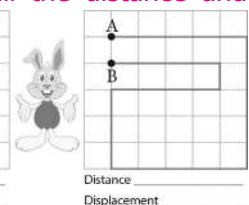
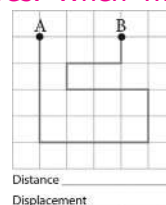
(The starting and finishing points should be different).

Distance: 17

Displacement: 3

Distance: 24

Displacement: 1



When the rabbit moves in a straight line from A to B, the distance and displacement will be equal.

5. When we represent the displacement, we use a positive or negative sign depending on the direction in which it travels. Displacement is considered to be positive and it is negative, when it travels from B to A.

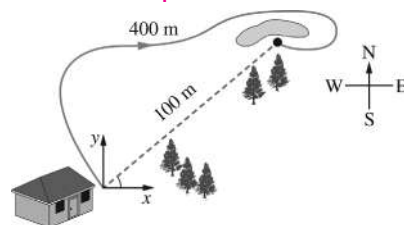
Subha goes to the nearby playground from her home. Look at the picture and answer the following questions.

1. What is the distance she travelled?

400 m.

2. What is her displacement?

100 m.



The distance travelled by an object is 15 km and its displacement is 15 km. What do you infer from this?

The object moves in a straight line in one direction without turning back.

The distance of a person is 30 km and his displacement is 0 km. What do you infer from this?

The distance of a person = 30 km

Displacement = 0 km

The person returns to the same position where he has started.

(i.e) The initial and the final position is same.

6. Answer the following questions:

- i) Calculate the velocity of a car travelling with a uniform velocity covering 100 m distance in 4 seconds.

$$\text{velocity} = \frac{\text{distance}}{\text{time}} = \frac{100}{4} = 25 \text{ m/s}$$

- ii) Usain Bolt covers 100 m distance in which is 9.58 seconds. Calculate his speed. If Usain Bolt competes with a Cheetah running at a speed of 30 m/s, Who will be the winner?

$$\text{Speed of Usain Bolt} = \frac{\text{Distance}}{\text{time}} = \frac{100}{9.58} = 10.43 \text{ m/s}$$

Speed of Usain Bolt = 10.43 m/s

Speed of Cheetah = 30 m/s

Cheetah will be the winner.

- iii) You are walking along east direction covering a distance of 4 m, then 2 m towards south, then 4 m towards west and at last 2 m towards north. You cover the total distance in 21 seconds, what is your average speed and average velocity?

Total distance covered = 12 m

Total time taken = 21 seconds

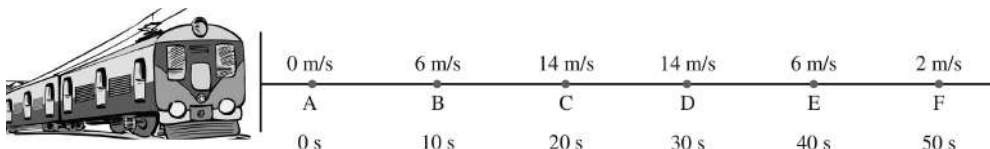
$$\begin{aligned}\text{Average speed} &= \frac{\text{Total distance covered}}{\text{total time}} \\ &= \frac{12m}{21} = 0.571 \text{ m/s}\end{aligned}$$

$$\text{Average velocity} = 0 \text{ m/s}$$

Average velocity is zero because the starting point and the finishing point is same
 $\therefore$ Displacement is zero so, average velocity is also.

$$\text{Average velocity} = \frac{\text{Total displacement}}{\text{time}}$$

7. The velocity at different times of a train departing direction is given in the figure. Analyse this and complete the table.



The distance travelled by train	Initial velocity (u) m/s	Final velocity (v) m/s	Change in velocity (v - u) m/s	Time taken (t) s	Acceleration = change in velocity / time $a = (v - u) / t$ m/s ²
A - B	0	6	6	10	0.6
B - C	6	14	$14 - 6 = 8$	10	0.8
C - D	14	14	$14 - 14 = 0$	10	0
D - E	14	6	$6 - 14 = -8$	10	-0.8
E - F	6	2	$2 - 6 = -4$	10	-0.4

Analysis:

When the trains covers the distance A to B and B to C, it is accelerated motion.

When it covers the distance C - D, there is no acceleration (i.e) uniform velocity.

When it covers the distance D to E and E to F it has negative acceleration or deceleration or retardation. (i.). Its velocity decreases with respect to time.

9. My name is cheetah. I can run at a great speed. Do you know what my speed is? It is 25 m/s to 30 m/s. My speed changes from 0 to 20 m/s in 2 second. See how good my acceleration is ! Can you calculate it?



$$\text{Acceleration of the cheetah} = \frac{\text{Final velocity}(v) - \text{Initial velocity}(u)}{\text{time taken}}$$

$$= \frac{v - u}{t} = \frac{20 - 0}{2} = \frac{20}{2} = 10 \text{ m/s}^2$$

$$\text{Acceleration of the cheetah} = 10 \text{ m/s}^2$$

9.

Time (s)	1	2	3	4	5
Velocity (m/s)	20 + 20	40 + 20	60 + 20	80 + 20	100 + 20
	(acceleration)				
	100 – 20	80 – 20	60 – 20	40 – 20	20 – 20
	(deceleration)				

When the velocity of the object is increasing by 20 m/s the acceleration is 20 m/s².

When the velocity of the object is decreasing by 20 m/s the deceleration is 20 m/s².

When the velocity of the object is decreasing by 20 m/s the deceleration is 20 m/s^2 .

$$\text{Deceleration} = \frac{\text{Decrease in velocity}}{\text{time}}$$

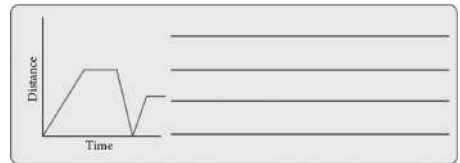
$$t = \frac{\text{Decrease in velocity}}{\text{Deceleration}}$$

$$t = \frac{20}{20} = 1s$$

The velocity of the object is decreasing by 20m/s in one second.

10. Imagine and write a story on your own for the given graph?

Raghul and his father starting from home to the school by car. At the school gate, he stopped the car to drop Raghul. After 2 minutes he went back to home to pick up his mother. Then they both started to got to their work. On the way, they are waiting for the signal.



Additional Questions

I. Choose the appropriate Answer.

1. SI unit of acceleration is _____.

- a) m/s b) m/s²
c) m d) m³

Ans: b) m/s^2

2. Speed is the rate of change of θ .

- a) Distance
b) Displacement
c) Acceleration
d) None of these

Ans: a) Distance

3. The Thanjavur doll is an example for neutral equilibrium.

- a) Stable b) Unstable
c) Neutral d) Thermal

Ans: b) Unstable

II. Fill in the blanks.

- One nautical mile is _____ km. **Ans: 1.852**
- 1 km/h = _____ m/s. **Ans: 5/18**
- For a meter scale the centre of gravity lies at its _____. **Ans: Centre**

III. State whether the following statements are true or false.

- Nautical mile is the unit for the distance in sea transportation. **Ans: True**
- A train starting and moving out of the station is an example for uniform velocity. **Ans: False**

Correct Statement : A train starting and moving out of the station is an example for non uniform velocity.

- The straight line path between two points is called distance. **Ans: False**

Correct Statement : The straight line path between two points is called displacement.

VI. Give short answer.**1. Define distance.**

The path taken by an object to reach one place from the other is called distance.

2. What is displacement?

The straight line path between two points is called displacement.

3. Distinguish between uniform velocity and Non uniform velocity.

S.No	Uniform velocity	Non uniform velocity
1.	A body has uniform velocity if it covers equal displacement in the same direction in equal interval of time.	If either speed or direction changes the velocity is non uniform.
2.	Eg: light travels through vacuum.	Eg: train starting and moving out of the station.

4. Mention the conditions for the stability of an object.

The conditions for the stability of an object are,

- ❖ Lower its centre of gravity
- ❖ Increase the area of its base.
- ❖ The base should be heavy and large.

5. What are the real life applications of centre of gravity?

- ❖ Racing cars are built low and broad for stability.
- ❖ Table lamps and fans are designed with large heavy based to make them stable.
- ❖ The luggage compartment of a tour bus is located at the bottom and not on the roof.

V. Answer in Detail.

1. What is acceleration? Explain the types of acceleration.

Acceleration: Acceleration is the rate of change in velocity. It's SI unit is m/s^2 .

Types of acceleration.

- | | |
|-------------------------|----------------------------|
| ❖ Positive acceleration | ❖ Uniform acceleration |
| ❖ Negative acceleration | ❖ Non uniform acceleration |

Positive acceleration:

If the velocity of an object increases with respect to time, then the object is said to be in positive acceleration.

Negative acceleration:

If the velocity of an object decreases with respect to time, then the object is said to be in negative acceleration.

Uniform acceleration:

An object undergoes uniform acceleration when the change in its velocity for every unit of time is the same.

Non uniform acceleration:

An object undergoes non uniform acceleration if the change in its velocity for every unit of time is not the same.

Formative Assessment - 2

Time: 15 mins.

Marks: 10

I. Choose the appropriate answer.

3×1=3

- A particle is moving in a circular path of radius r the displacement after half a circle be
a) Zero b) R c) $2r$ d) $r/2$
- Light travels through vacuum is an example for _____.
a) Uniform velocity b) Non uniform velocity
c) Positive acceleration d) Negative acceleration
- SI unit for acceleration is _____.
a) m/s b) m/s^2 c) m^2/s d) m

II. Fill in the blanks.

3×1=3

- The shortest distance between the two places is _____.
- The slope of the speed – time graph gives _____.
- In _____ equilibrium its centre of gravity remains at the same height when it is displaced.

III. Analog.

4×1=4

- one nautical mile : 1.852 km :: one km/hr : _____.
- length of scale : meter :: speed of aeroplane : _____.
- displacement/time : velocity :: speed/time : _____.
- velocity increases : positive acceleration :: velocity decreases : _____.



Unit

3

Matter Around Us

Evaluation

I. Choose the appropriate answer.

1. Which of the following is an example of a metal?

- a) Iron b) Oxygen
c) Helium d) Water **Ans: a) Iron**

Ans: a) Iron

2. Oxygen, hydrogen, and sulphur are examples for?

- a) Metals b) Non-metals
c) Metalloids d) Inert gases **Ans: b) Non-metals**

Ans: b) Non-metals

3. Which of the following is a short and scientific way of representing one molecule of an element or compound?

- a) Mathematical formula b) Chemical formula
c) Mathematical symbol d) Chemical symbol **Ans: d) Chemical symbol**

Ans: d) Chemical symbol

4. The metals which is a liquid at room temperature is _____.

- a) Chlorine b) Sulphur
c) Mercury d) Silver **Ans: c) Mercury**

Ans: c) Mercury

5. An element which is always lustrous, malleable and ductile is _____.

- a) non-metal b) metal
c) metalloid d) gas **Ans: b) metal**

Ans: b) metal

II. Fill in the blanks.

1. The smallest particle of matter that can exist by itself is _____. Ans: atom
2. A compound containing one atom of carbon and two atoms of oxygen is _____. Ans: carbon dioxide
3. _____ is the only non-metal conducts electricity. Ans: Graphite
4. Elements are made up of _____ kinds of atoms. Ans: same
5. _____ of some elements are derived from Latin or Greek names of the elements. Ans: Symbol
6. There are _____ number of known elements. Ans: 118



7. Elements are the _____ form of pure substances. **Ans: simplest**
8. The first letter of an element always written in _____ letter. **Ans: capital**
9. Molecule containing more than three atoms are known as _____. **Ans: poly atomic molecule**
10. _____ is the most abundant gas in the atmosphere. **Ans: Nitrogen**

III. Analogy.

1. Mercury : liquid at room temperature :: Oxygen: _____. **Ans: Gas at room temperature**
2. Non metal conducting electricity: _____ :: Metal conducting electricity: Copper **Ans: Graphite**
3. Elements : combine to form compounds :: Compounds : _____. **Ans: Split into elements**
4. Atoms : fundamental particle of an element :: _____ : fundamental particles of a compound. **Ans: Elements**

IV. State true or false. If False, give the correct statement.

1. Two different elements may have similar atoms. **Ans: False**
Correct Statement : Two different elements may have different atoms.
2. Compounds and elements are pure substance. **Ans: True**
3. Atoms cannot exist alone : they can only exist as groups called molecules. **Ans: False**
Correct Statement : Atoms of noble gases can exist alone as they have completely filled outer most shell.
4. NaCl represents one molecules of sodium chloride. **Ans: True**
5. Argon is mono atomic gas. **Ans: True**

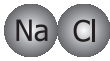
V. Answer in brief.

1. Write the chemical formula and name the elements present in the following compounds:

- | | | |
|--------------------|------------------------|--------------------|
| a. Sodium chloride | b. Potassium hydroxide | c. Carbon-di-oxide |
| d. Calcium oxide | e. Sulphur dioxide | |

	Compounds	Chemical formula	Elements present
1	Sodium chloride	NaCl	Sodium, Chlorine
2	Potassium hydroxide	KOH	Potassium, Oxygen, Hydrogen
3	Carbon dioxide	CO ₂	Carbon, Oxygen
4	Calcium oxide	CaO	Calcium, Oxygen
5	Sulphur dioxide	SO ₂	Sulphur, Oxygen

2. Classify the following molecules as the molecules of element or compound.

1.  → Element
2.  → Compound
3.  → Element
4.  → Compound

3. What do you understand by chemical formula of a compound? What is its significance?

- ❖ A chemical formula is a symbolic representation of one molecule of an element or a compound.
- ❖ It provides information about the elements present in the molecule and the number of atoms of each element.

4. Define the following terms with an example of each:

- a. Element
- b. Compound
- c. Metal
- d. Non metal
- e. Metalloid

- a. Element : Elements are the simplest form of pure substances.
Eg: silver, copper.
- b. Compound : A compound is a pure substance that is formed when the atoms of two or more elements combine chemically in definite proportions.
Eg: NaCl, sugar.
- c. Metal : Elements that are hard, shiny and malleable are called as metals.
Eg: sodium, iron.
- d. Non metal : A Chemical element that lacks the characteristics of a metal is known as a non – metal. **Eg:** chlorine, bromine.
- e. Metalloid : Elements which exhibit the properties of both metals and non – metals are known as metalloid. **Eg:** boron, silicon.

5. Write the symbols for the following elements and classify them as solid, liquid and gas.

aluminum, carbon, chlorine, mercury, hydrogen and helium.

S. No.	Element	Symbol	State
1	Aluminium	Al	solid
2	Carbon	C	solid

3	Chlorine	Cl	gas
4	Mercury	Hg	liquid
5	Hydrogen	Hg	gas
6	Helium	He	gas

6. Classify the following as metals, non-metals and metalloids.

Sodium, Bismuth, Silver, Nitrogen, Silicon, carbon, chlorine, Iron, Copper.

Metals	Sodium, Bismuth, Silver, Iron, Copper.
Non-metals	Nitrogen, Carbon, Chlorine.
Metalloids	Silicon.

7. Classify the following as elements and compounds.

Water, Common salt, Sugar, Carbon dioxide, Iodine and Lithium.

Elements	Iodine, Lithium.
Compounds	Water, Common salt, Sugar, Carbob-di-oxide.

8. Write the chemical formula for the following elements.

a. Hydrogen

b. Nitrogen

c. Ozone

d. Sulphur

❖ Hydrogen – H_2

❖ Ozone – O_3

❖ Nitrogen – N_2

❖ Sulphur – S

9. What are elements? What are they made of? Give two examples.

- ❖ Elements are the simplest form of pure substances.
- ❖ Elements are made up of fixed number of one type of atoms.
- ❖ **Eg:** Copper, Silver, Oxygen, Carbon.

10. Define molecule.

A molecule is made up of two or more atoms chemically combined.

11. What are compounds? Give two examples.

A compound is a pure substance that is formed when the atoms of two or more elements combine chemically in definite proportions.

Eg: Sodium chloride, Sugar, Water.

12. Give an example for the elements derived from their Latin names.

Gold - Aurum; Copper - Cuprum.

13. What is atomicity of elements?

Atomicity is the total number of atoms present in one molecule of an element, compound or a substance.

14. Calculate the atomicity of H_2SO_4 .

Atomicity of H_2SO_4 .

Number of Hydrogen atoms = 2



Number of Sulphur atoms = 1
Number of Oxygen atoms = 4
 $\therefore$ Atomicity of H_2SO_4 = 7

VI. Answer in detail.

1. Differentiate metals and non metals.

S.No.	Metals	Non-metals
1.	Metals are generally hard.	Non - metals are generally soft.
2.	Metals are lustrous.	Non metals are non lustrous.
3.	metals have shiny surface.	Non metals have non shiny surface.
4.	metals are bendable.	Non metals are non bendable.
5.	Metals are malleable.	Non metals are non malleable.
6.	Most metals are good conductors of heat and electricity.	Non metals are bad conductors of heat and electricity.
7.	Most metals make ringing sound when they struck.	Non metals do not make any sound when they struck.

2. Explain the characteristics of compounds.

- ❖ A compound is formed only when the constituent elements combine in a fixed proportion.
- ❖ The properties of a compound are different from those of its constituent elements.
- ❖ A compound cannot be broken down by physical methods.
- ❖ A compound can be separated into its constituent elements by chemical methods only.
- ❖ Compounds are homogeneous.

3. Describe the different ways in which we can write the symbols of elements. Give appropriate examples.

- ❖ Chemical symbols usually consists of one or two letters.
- ❖ The symbols of most elements correspond to the first letter of their English name. (which is capitalized).
Eg: Symbol for Oxygen – O
Symbol for Hydrogen – H
- ❖ When there is more than one element that begins with the same letter their symbols take two letters. The first letter is capitalized. While the second letter has a lower based.
Eg: Symbol for Carbon – C
Symbol for Calcium – Ca
Symbol for Chlorine – Cl
- ❖ The symbols for some elements are derived from their Latin names

Eg: Symbol for gold – Au (Latin name Aurum)
Symbol for copper – Cu (Latin name Cuprum)

4. Differentiate between elements and compounds.

S.No.	Elements	Compounds
1.	An element is the simplest substance.	A compound is a chemical substance formed by the combination of two or more elements.
2.	elements combine to form compounds.	Compounds can be split into elements.
3.	Atoms are the fundamental particle of an element.	Molecules are the fundamental particles of a compounds.

5. Write any five characteristics of compound.

- ❖ Compounds exhibit properties entirely different from the properties of their constituent elements.
- ❖ For example the atoms of the elements hydrogen and oxygen combine chemically in a fixed ratio to form the compound water.
- ❖ But water does not have the same properties as hydrogen and oxygen.
- ❖ For example at room temperature water exists as liquid while hydrogen and oxygen exist as gases.
- ❖ Also oxygen supports fire whereas water is used as a fire extinguisher.

6. Compare properties of metals and non-metals. Give three examples of each.

S.No.	Properties	Metals	Non-metals
1	State	Metals are solids at room temperature. Eg: copper, silver, gold.	Non-metals may be solid, liquid or gases. Eg: carbon, bromine, oxygen.
2	Hard	Metals are generally hard. Eg: iron, copper, nickel.	Non-metals are generally soft. Eg: carbon, phosphorus, sulphur.
3	Conductors	Metals are good conductors of heat and electricity. Eg: copper, aluminium, silver.	Non-metals are bad conductors of heat and electricity. Eg: iodine, phosphorus, sulphur.
4	Bendable	Most metals are bendable. Eg: copper, iron, silver.	Non metals are non bendable. Eg: carbon, sulphur, phosphorus.
5	Lustrous	Metals are lustrous. Eg: copper, silver, gold.	Non-metals are non lustrous. Eg: carbon, phosphorus, sulphur

**7. Write down the properties of metalloids.**

- ❖ Metalloids are all solid at room temperature.
- ❖ Metalloids exhibit the properties of both metals and non-metals.
- ❖ Metalloids have a metallic appearance but they are brittle.
- ❖ They can form alloys with metals.
- ❖ The physical properties of metalloids tend to be metallic but their chemical properties tend to be non – metallic.

VII. Rewrite the sentence in correct form.**1. Elements contains two or more kinds of atoms and compounds contains only one kinds of atoms.**

Elements contains only one kind of atoms and compounds contains two or more kinds of atoms.

VIII. Higher order Thinking Questions.**1. Lists out the metals, non-metals and metalloids which you use in your house, schools. Compare their properties.****In House**

Metals	Non metals	Metalloids
Copper, Aluminum, Iron, Silver, Gold.	Chlorine (bleaching powder) Gallium (mobile phones) Inert gases (different lights)	Silicon (Computer ships car parts cosmetics)

In School

Metals	Non metals	Metalloids
Copper Iron	Chlorine, Iodine (lab), Carbon (graphite)	Silicon

Comparison of Properties

S.No.	Metals	Non metals	Metalloids
1.	Mostly solids	May be solids. Liquids or gases	Solids
2.	Shiny surface	Non shiny surface	Metallic appearance
3.	Bendable	Non bendable	Brittle
4.	Ductile	Non ductile	Non ductile
5.	Good conductors	bad conductors	Semi conductors

2. What changes take place in the movement and arrangement of particles during heating process?

During heating the particles is a solid gain energy and move slightly further apart from one another. This causes the volume of a solid to increase. During heating, the distance between the particles change but the mass is conserved.

4. In the diagram below, the circle, square and triangle represent the atoms of different elements.



Identify all combinations that represent

- molecule of a compound.
- molecule of an element consisting of two atoms.
- molecule of an element consisting of three atoms.

a)  A molecule of a compound.

b)  A molecule of an element consisting of two atoms.

c)  A molecule of an element consisting of three atoms.

4. Aakash noticed that the metal latch on gate was difficult to open during hot sunny days. However, this same latch was not difficult to open at night. Aakash observed that the latch and the gate are exposed to the sun during the day.

- Formulate a hypothesis based on the information provided.
- Briefly state how you would test the hypothesis.

a. Formulate a hypothesis based on the information provided.

During not sunny days due to heat the particles in the solid gain energy and move slightly apart from one another. Thus the volume of the solid increases. This process is called expansion.

b. Briefly state how you would test the hypothesis stated in (a).

In summer days the wires between two electric poles expand as the temperature rises. The two ends are fixed. So the wire starts hanging down.

IX. Consider the following statements and choose the correct option.

- Both assertion and reason are true and reason is the correct explanation of assertion.
- Both assertion and reason are true but reason is not the correct explanation of assertion.
- Assertion is true but reason is false.
- Assertion is false but reason is true.

1. **Assertion** : Oxygen is a compound
Reason : Oxygen cannot be broken down into anything simpler. **Ans: (a)**
2. **Assertion** : Hydrogen is an element
Reason : Hydrogen cannot be broken down into anything simpler. **Ans: (a)**
3. **Assertion** : Air is a compound
Reason : Air consists of carbon dioxide. **Ans: (d)**
4. **Assertion** : Air is a mixture of elements only
Reason : Only nitrogen, oxygen and neon gases exist in air. **Ans: (a)**
5. **Assertion** : Mercury is solid in room temperature
Reason : Mercury is a non-metal. **Ans: (d)**

Correct statement:

- i) Mercury is liquid at room temperature
- ii) Mercury is a metal.

Activity 1

Complete the following table.

Compound	Constituent Elements
Water	Hydrogen, Water
Salt (sodium chloride)	Sodium, Chlorine
Sodium carbonate	Sodium, Carbon, Oxygen
Baking soda (sodium bicarbonate)	Sodium, Hydrogen, Carbon, Oxygen
Sugar	Carbon, Hydrogen, Oxygen
Calcium oxide	Calcium, Oxygen
Calcium hydroxide	Calcium, Hydrogen, Oxygen
Sodium hydroxide	Sodium, Hydrogen, Oxygen
Potassium hydroxide	Potassium, Oxygen, Hydrogen

Activity 2

Complete the following table.

Formula	No. of different elements	Name of Elements
H ₂ O	2	Hydrogen, Oxygen
NaCl	2	Sodium, Chlorine
C ₆ H ₁₂ O ₆	3	Carbon, Hydrogen, Oxygen
NaOH	3	Sodium, Oxygen, Hydrogen

Activity 3

Find out the symbols of the elements with the help of your teacher.

Elements	Symbol	Elements	Symbol
Gold	Au	Aluminium	Al
Silver	Ag	Calcium	Ca
Copper	Cu	Phosphorus	P
Iron	Fe	Magnesium	Mg
Nitrogen	N	Potassium	K
Oxygen	O	Sodium	Na

Activity 4

Write down atomicity of the following elements and compounds.

Elements and Compounds	Atomicity
Cl	2
Na	1
K	1
Ca	1
H ₂ O	H – 2; O – 2
NaCl	Na – 1; Cl – 1

Additional Questions

I. Choose the appropriate answer.

1. _____ is the only non metal that is liquid at room temperature.

- a) Chlorine b) Oxygen
c) Hydrogen d) Bromine

Ans: b) Oxygen

2. _____ is used as manure in agriculture.

- a) Sulphur b) Carbon
c) Copper d) Iron

Ans: a) Sulphur

3. _____ is the only metal which is soft.

- a) Magnesium b) Iron
c) Sodium d) Silver

Ans: c) Sodium

II. Fill in the blanks.

1. The boiling point of water is _____. **Ans: 1000 c**
2. The atomicity of water is _____. **Ans: 3**
3. _____ is the first scientist used the term element. **Ans: Robert Boyle**

III. True of False. If False, give the correct statement.

1. Silicon is used for making computer chips. **Ans: True**
2. Ozone is an example for polyatomic molecule. **Ans: False**
Correct Statement : Ozone is an example for Tri atomic molecule.
3. Germanium is used for making mobile phones. **Ans: False**
Correct Statement : Gallium is used for making mobile phones.

VI. Analogy.

1. Iodine : non metal : : Silicon : _____. **Ans: Metalloid**
2. Calcium : element : : chalk : _____. **Ans: Compound**
3. Sulphur : agriculture : : phosphorus : _____. **Ans: Crackers**

V. Answer in Short.**1. What are the elements present in air?**

Nitrogen and oxygen, make up about 99% of air. The rest includes small amount of argon, neon and helium.

2. How do hot air balloons float?

- ❖ When air inside the hot air balloon is heated with the burner it expands and the density of the air inside the balloon decreases.
- ❖ As the air inside the balloon has lower density than the air outside the balloon, it floats.

3. What happens to matter during heating?

The matter begins to expand when it is heated. As the particles gain energy and move slightly apart from one another the volume of matter increases.

4. Name the elements present in human body.

The elements present in human body are oxygen, carbon, hydrogen, nitrogen, calcium and phosphorus.



Formative Assessment - 3

Time: 15 mins.

Marks: 10

I. Fill in the blanks.**3×1=3**

1. The atomicity of water is _____.
2. There are _____ number of known elements.
3. Molecules containing more than three atoms are known as _____.

II. Choose the appropriate answer.**3×1=3**

1. The metal which is liquid at room temperature is _____.
a) Chlorine b) Sulphur c) Mercury d) Silver
2. _____ is used as manure in agriculture
a) Sulphur b) Carbon c) Copper d) Iron
3. The boiling point of water is _____.
a) 50 b) 80 c) 90 d) 100

III. State whether the following statements are true or False**2×1=2**

1. The different elements may have different atoms.
2. Argon is mono atomic gas.

IV. Analogy.**2×1=2**

1. Iodine : Non metal :: Silicon : _____.
2. Sulphur : Agriculture :: Phosphorus : _____.



Unit

4

Atomic Structure

Evaluation

FIRST TERM

5-in-1

I. Choose the appropriate answer.

1. The basic unit of matter is _____.

- a) element b) atom
c) molecule d) electron

Ans: b) atom

2. The subatomic particle revolve around the nucleus is _____.

- a) atom b) neutron
c) electron d) proton

Ans: c) electron

3. _____ is positively charged.

- a) Proton b) Electron
c) Molecule d) Neutron

Ans: a) Proton

4. The atomic number of an atom is the _____.

- a) number of neutrons
b) number of protons
c) total number of protons and neutrons
d) number of atoms

Ans: b) number of protons

5. Nucleons comprises of _____

- a) protons and electrons b) neutrons and electrons
c) protons and neutrons d) neutrons and positron

Ans: c) protons and neutrons

II. Fill in the blanks.

1. The smaller particles found in the atom is called _____.

Ans: sub-atomic particles

2. The nucleus has _____ and _____.

Ans: Protons, Neutrons

3. The _____ revolve around the nucleus.

Ans: electrons

4. If the valency of carbon is 4 and that of hydrogen is 1, then the molecular formula of methane is _____.

Ans: CH₄



5. There are two electrons in the outermost orbit of the magnesium atom. Hence, the valency of magnesium is _____.
Ans: 2

III. Match the following.

- | | |
|--------------------------------|--|
| 1. Valency | - a) Fe |
| 2. Neutral particle | - b) Proton |
| 3. Iron | - c) Electrons in the outer most orbit |
| 4. Hydrogen | - d) Neutron |
| 5. Positively charged Particle | - e) Monovalent |

Ans: 1.c 2.d 3.a 4.e 5.b

IV. State true or false. If false, correct the statement.

- | | |
|--|-------------------|
| 1. The basic unit of an element is molecule. | Ans: False |
| Correct Statement : The basic unit of an element is atom. | |
| 2. The electrons are positively charged. | Ans: False |
| Correct Statement : The electrons are negatively charged. | |
| 3. An atom is electrically neutral. | Ans: True |
| 4. The nucleus is surrounded by protons. | Ans: False |
| Correct Statement : The nucleus is surrounded by electrons. | |

V. Complete the analogy.

- | | |
|---|-------------------------------|
| 1. Sun : nucleus :: planets : _____. | Ans: electrons |
| 2. Atomic number : _____ :: Mass number : number of protons and neutrons. | Ans: Number of protons |
| 3. K : Potassium :: C : _____. | Ans: Carbon |

VI. Consider the following statements and choose the correct option.

- Assertion :** An atom is electrically neutral.
Reason : Atoms have equal number of protons and electrons.
Ans: Both assertion and Reason are correct. Reason gives the correct explanation for the assertion.
- Assertion :** The mass of an atom is the mass of nucleus.
Reason : The nucleus is at the centre.
Ans: Both assertion and Reason are correct. Reason gives the correct explanation for the assertion.
- Assertion :** The number of protons and neutrons is atomic number.
Reason : The mass number is sum of protons and neutrons.
Ans: Assertion is false but reason is the correct statement.

VII. Answer very briefly:**1. Define – atom.**

An atom is the smallest particle of a chemical element that retains chemical properties.

2. Name the sub-atomic particles.

Proton, electron and neutron are the subatomic particles.

3. What is atomic number?

Atomic number is the number of protons in an atom.

4. What are the characteristics of proton?

- ❖ The proton is the positively charged particle and is located in the nucleus.
- ❖ Its positive charge is of the same magnitude as that of the electron's negative charge.

5. Why neutrons called neutral particles?

Neutrons do not have any charge. So they are called as neutral particles.

VIII. Answer briefly.**1. Distinguish Isotopes from Isobar.**

S.No.	Isotopes	Isobars
1.	Atoms that have same atomic number but different mass number are called isotopes.	Atoms that have the same mass number but different atomic number are called isobars.
2.	Eg: ${}_1\text{H}^1, {}_1\text{H}^2, {}_1\text{H}^3$	Eg: ${}_{20}\text{Ca}^{40}, {}_{18}\text{Ar}^{40}$

2. What are isotones? Give one example.

- ❖ Two nuclides which have same neutron number but different proton numbers are called isotones.
- ❖ **Eg:** Boron – 12 and carbon – 13 nuclei, both contain 7 neutrons.

3. Differentiate mass number from atomic number.

S.No.	Atomic number	Mass number
1.	The number of protons in an atom is called atomic number	The total number of protons and neutrons present in the nucleus of an atom is called mass number.
2.	It is represented by the letter Z.	It is represented by the letter A.

4. The atomic number of an element is 9. It has 10 neutrons. Find the element from the periodic table. What will be its mass number?

The given element is Fluorine

$$\begin{aligned}
 \text{Mass number} &= \text{Number of protons} + \text{Number of neutrons} \\
 &= 9 + 10 = 19 \\
 \text{Mass number of fluorine} &= 19
 \end{aligned}$$

IX. Answer in detail.

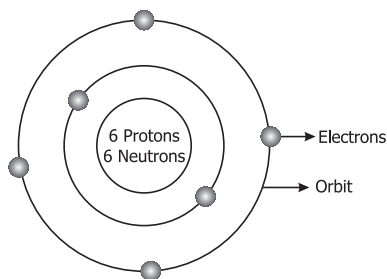
1. Draw the atom structure and explain the position of the sub-atomic particles.

Proton:

- ❖ The proton is the positively charged particle.
- ❖ It is located in the nucleus.
- ❖ The electron is the negative charged particle.
- ❖ Electrons revolve around the nucleus of the atom in specific orbits.

Neutron:

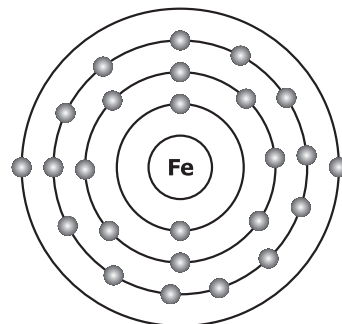
- ❖ The neutron is inside the nucleus.
- ❖ Neutron is inside the nucleus.



Structure of carbon atom

2. The atomic number and the mass number of an element is 26 and 56 respectively. Calculate the number of electrons, protons and neutrons in its atom. Draw the structure.

$$\begin{aligned}
 \text{Mass number of an element} &= 56 \\
 \text{Atomic number} &= 26 \\
 \text{Number of protons} &= 26 \\
 \text{Number of electrons} &= 26 \\
 \text{Number of neutrons} &= \text{Mass number} - \text{Atomic Number} \\
 &= 56 - 26 = 30
 \end{aligned}$$



3. What are nucleons? Why are they called so? Write the properties of the nucleons.

Nucleons:

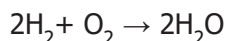
- ❖ The protons and neutrons are called nucleons.
- ❖ As protons and neutrons are located in the nucleus they are called as nucleons.

**Properties of Nucleons:**

- ❖ Nucleons occupy small space within the nucleus.
- ❖ The number of nucleons holds the nucleus with a strong force.
- ❖ When the force is broken, it can produce a lot of power termed as nuclear energy.
- ❖ The size of the nucleon is about 1.6 fm. (fermi). (10^{-15}m).

4. Define valency? What is the valency of the element with atomic number 8? What is the compound by this element with hydrogen?**Valency:**

- ❖ Valency is defined as the combining capacity of an element.
- ❖ The valency of the element with atomic number 8 is 2.
- ❖ The compound by the element (OXYGEN) with hydrogen is water.

**X. Higher Order Thinking Skills.****1. An atom of an element has no electron. Will that atom have any mass or not? Can atom exist without electron? If so then give example.**

- ❖ If an atom of an element has no electron, that atom has mass.
- ❖ Atom cannot exist without electrons.

2. What is common salt? Name the elements present in it. Write the formula of common salt. What are the atomic number and the mass number of the elements? Write the ions in the compound.

- ❖ Common salt is sodium chloride.
- ❖ Sodium and chlorine are the elements present in common salt.
- ❖ The formula of common salt is NaCl.

Element	Atomic number	Mass number
Sodium	11	23
Chlorine	17	35

- ❖ The ions in common salt are Na^+ and Cl^- .

Try yourself.**1. Why are atomic numbers and mass numbers always whole numbers?**

- ❖ Atomic number is always a whole number because there must always be a whole number of protons in a nucleus.
- ❖ Mass number is always a whole number because the number of protons and neutrons in the nucleus is always a whole number not a fraction.

2. A sulphur atom contains 16 Protons and 16 neutrons. Calculate its atomic number and atomic mass number.

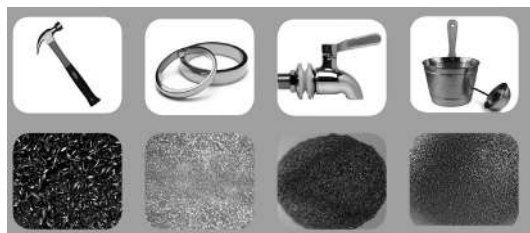
Number of protons = 16
 $\therefore$ Atomic number = Number of protons = 16
 Atomic mass number = Number of protons + Number of neutron
 = $16 + 16 = 32$

Activity 1

Some known objects and its broken particles are shown.

1. Name the objects you see here? Also try to write What each of it made of?

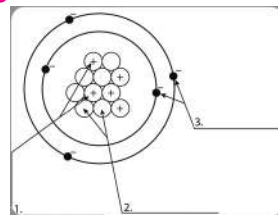
1. Hammer made of Iron
2. Bangles made of glass
3. Tap made of steel
4. Vessels made of Aluminum or steel



Activity 2

Label the parts in the given diagram and answer the following.

1. The positively charged particle is Proton.
2. The negatively charged particle is Electron.
3. Neutron is neutral particle.



Activity 3

H Hydrogen Atomic Number: 1 Atomic Mass: 1 Protons: 1 Neutrons: 0 Electrons: 1	He Helium Atomic Number: 2 Atomic Mass: 4 Protons: 2 Neutrons: 2 Electrons: 2	Li Lithium Atomic Number: 3 Atomic Mass: 7 Protons: 3 Neutrons: 4 Electrons: 3	Be Beryllium Atomic Number: 4 Atomic Mass: 9 Protons: 4 Neutrons: 5 Electrons: 4	B Boron Atomic Number: 5 Atomic Mass: 11 Protons: 5 Neutrons: 6 Electrons: 5
C Carbon Atomic Number: 6 Atomic Mass: 12 Protons: 6 Neutrons: 6 Electrons: 6	N Nitrogen Atomic Number: 7 Atomic Mass: 14 Protons: 7 Neutrons: 7 Electrons: 7	O Oxygen Atomic Number: 8 Atomic Mass: 16 Protons: 8 Neutrons: 8 Electrons: 8	F Fluorine Atomic Number: 9 Atomic Mass: 19 Protons: 9 Neutrons: 10 Electrons: 9	Ne Neon Atomic Number: 10 Atomic Mass: 20 Protons: 10 Neutrons: 10 Electrons: 10
Na Sodium Atomic Number: 11 Atomic Mass: 23 Protons: 11 Neutrons: 12 Electrons: 11	Mg Magnesium Atomic Number: 12 Atomic Mass: 24 Protons: 12 Neutrons: 12 Electrons: 12	Al Aluminium Atomic Number: 13 Atomic Mass: 27 Protons: 13 Neutrons: 14 Electrons: 13	Si Silicon Atomic Number: 14 Atomic Mass: 28 Protons: 14 Neutrons: 14 Electrons: 14	P Phosphorus Atomic Number: 15 Atomic Mass: 31 Protons: 15 Neutrons: 16 Electrons: 15
S Sulfur Atomic Number: 16 Atomic Mass: 32 Protons: 16 Neutrons: 16 Electrons: 16	Cl Chlorine Atomic Number: 17 Atomic Mass: 35 Protons: 17 Neutrons: 18 Electrons: 17	Ar Argon Atomic Number: 18 Atomic Mass: 39 Protons: 18 Neutrons: 20 Electrons: 18	K Potassium Atomic Number: 19 Atomic Mass: 39 Protons: 19 Neutrons: 20 Electrons: 19	Ca Calcium Atomic Number: 20 Atomic Mass: 40 Protons: 20 Neutrons: 20 Electrons: 20



Observe the table given above and answer the following questions.

1. I am used for breathing, without me you cannot live. Write my name and symbol.

Name : Oxygen, Symbol : O.

2. It is used in filling the balloons. It is a gas, identify it. What is its mass number?

Helium, Mass number 4

3. Name the element present in banana. What is my atomic number?

Potassium, Atomic number: 19

4. I am found in crackers. How many protons do i have?

Phosphorous, Number of protons: 15

5. I am the most valuable element. Find who am I? Can you say my mass number?

Carbon, Mass number: 12

Additional Questions

I. Choose the appropriate answer.

1. One nanometer is equal to _____.

a) 10^{-7}m

b) 10^{-8}m

c) 10^{-9}m

d) 10^{-10}m

Ans: c) 10^{-9}m

2. In MgCl_2 the valency of Mg is _____.

a) 1

b) 2

c) 3

d) 4

Ans: b) 2

3. Lithium atom contains 3 protons and 4 neutrons. The atomic number of Lithium is _____.

a) 1

b) 2

c) 3

d) 4

Ans: c) 3

II. Fill in the blanks.

1. The electrons revolve around the nucleus in specific _____.

Ans: orbit

2. The element present in banana is _____.

Ans: potassium

3. Dalton stated that an atom is in space _____.

Ans: spherical

III. True or False. If False, give the correct statement.

1. Dalton compared an atom to a watermelon.

Ans: False

Correct Statement : J.J. Thomson compared an atom to a watermelon.

2. The nucleus at the centre of the atom has positive charge.

Ans: True

3. The valency of Hydrogen is 2.

Ans: False

Correct Statement : The valency of Hydrogen is 1.

IV. Match the following.

- | | | |
|-------------|---|--------------------|
| 1. Atom | - | a) Divalent |
| 2. Nucleus | - | b) energy level |
| 3. Bohr | - | c) Trivalent |
| 4. Oxygen | - | d) neutral |
| 5. Nitrogen | - | e) Positive charge |

Ans: 1.d 2.e 3.b 4.a 5.c

VI. Analogy.

- Size of Red Blood cell : 10^{-4} m :: size of an atom : _____.
- Breathing : Oxide :: Balloons : _____.
- Ferrous oxide : valency 2 :: ferric oxide : _____.

Ans: 10^{-10} m

Ans: Helium

Ans: valency 3

V. Give short answer.

1. Why an atom is electrically neutral?

The total negative charge of all the electrons outside the nucleus of an atom is equal to the total positive charge in the nucleus. That makes the atom electrically neutral.

2. Find the number of protons, electrons and neutrons in ${}_5\text{B}^{11}$.

In ${}_5\text{B}^{11}$,

$$\begin{aligned}\text{Number of protons} &= 5 \\ \text{Number of electrons} &= 5 \\ \text{Number of neutrons} &= 11 - 5 = 6\end{aligned}$$

3. What makes atoms stick together?

Electrons carry a negative electric charge and protons carry a positive charge. The attraction between them holds electrons in orbit.

4. State Dalton's consists of very small particles called atoms.

- ❖ Matter consists of very small particles called atoms.
- ❖ An atom is the smallest indivisible particle.
- ❖ An atom is spherical in shape.

VII. Answer in detail.

1. Explain Rutherford's theory of structure of atom.

- ❖ The nucleus at the centre of the atom has the positive charge.
- ❖ Most of the mass of the atom is concentrated at the centre of the nucleus.
- ❖ The negatively charged electrons revolve around the nucleus.
- ❖ In comparison with the size of the atom, the nucleus is very very small.

**Formative Assessment - 4**

Time: 15 mins.

Marks: 10

I. Choose the appropriate answer.**3×1=3**

- The basic unit of matter is _____.
a) element b) atom c) molecule d) electron
- _____ is negatively charged.
a) Proton b) Electron c) Molecule d) Neutron
- One nanometer is equal to _____.
a) 10^{-7} m b) 10^{-8} m c) 10^{-9} m d) 10^{-10} m

II. Fill in the blanks.**3×1=3**

- The element present in banana is _____.
- The _____ revolve around the nuclear.
- The smaller particles found in the atom is called _____.

III. State whether the following statements are True or False.**2×1=2**

- An atom is electrically neutral.
- The valency of hydrogen is 2.

IV. Analogy.**2×1=2**

- Sun : Nucleus :: planets : _____.
- O : Oxygen :: Na : _____.



Unit

5

Reproduction and Modification in Plants



Evaluation

I. Choose the appropriate answer.

1. **Vegetative propagation by leaves takes place in _____.**

- a) bryophyllum b) fungi
c) virus d) bacteria

Ans: a) bryophyllum

2. **Asexual reproduction in yeast is _____.**

- a) spore formation b) fragmentation
c) pollination d) budding

Ans: d) budding

3. **Reproductive part of a plant is _____.**

- a) root b) stem
c) leaf d) flower

Ans: d) flower

4. **Pollinators are _____.**

- a) wind b) water
c) insect d) all the above

Ans: d) all the above

5. **Climbing roots are seen in _____.**

- a) betel b) black pepper
c) both of them d) none of them

Ans: c) both of them

II. Fill in the blanks.

- The male reproductive part of a flower is _____.
- _____ is the basal swollen part of the Gynoecium.
- After fertilization the ovule becomes _____.
- Breathing roots are seen in _____ plants.
- Onion and Garlic are example for _____.

Ans: Androecium

Ans: Ovary

Ans: seed

Ans: mangrove

Ans: bulb

III. State true or false, If false, correct the statement:

1. A complete flower has four whorls. Ans: True
2. The transfer of pollen to the stigma is known as pollination. Ans: True
3. Conical shaped root is carrot. Ans: True
4. Ginger is an underground root. Ans: False
Correct Statement : Ginger is an underground stem.
5. Leaves of Aloe vera are fleshy and store water. Ans: True

IV. Match the following.

- | | | | |
|----------------|---|--------------------|--------------------------|
| 1. Petal | - | a) opuntia | |
| 2. Fern | - | b) chrysanthemum | |
| 3. Phylloclade | - | c) attracts insect | |
| 4. Hooks | - | d) spore | |
| 5. Sucker | - | e) bignonia | Ans: 1.c 2.d 3.a 4.e 5.b |

V. Answer very briefly:**1. Write two types of reproduction in plants.**

The two types of reproduction are,

- ❖ Sexual reproduction
- ❖ Asexual reproduction

2. What are the two important parts of a flower?

The two important parts of a flower are,

- ❖ Petal
- ❖ Sepal

3. Define – Pollination.

Transfer of pollen grains from the anther to stigma is called pollination.

4. What are the agents of pollination?

The agents of pollination are wind, water, insects, birds and animals.

5. Give example for - a. Corm b. Tuber

Corm - Colocasia; Tuber - Potato

6. What is tendrils?

A tendril is a specialized leaf of a climber that is modified into elongated structure to help the plants climb efficiently.

7. What are thorns?

Thorns are the small, sharp pointed growth on the stem of a plant.



VI. Answer briefly:

1. Differentiate bisexual flower from unisexual flower?

S.No.	Unisexual flower	Bisexual flower
1.	Unisexual flower contains male and female reproductive part in separate flowers.	Bisexual flower contains male and female part in the same flower.
2.	Eg: Papaya watermelon, coconut flowers.	Eg: Lily, Rose, Sunflower

2. What is Cross Pollination?

Transfer of pollen grain from the anther of one flower to the stigma of another flower of the same kind is called as cross pollination.

3. Write notes on phyllode.

- ❖ In acacia auriculiformis, petioles expand to form leaf like structure.
- ❖ They carry out the function of leaf. (Photosynthesis).

VII. Answer in Detail.

1. Write a brief account on pollination.

Pollination:

- ❖ Transfer pollen grains from the anther to stigma is called pollination.
- ❖ Agents like wind, water, insects, birds and animals are helpful for pollination and are known as pollinators.

Self pollination:

- ❖ Transfer of pollen grains from the anther of one flower to the stigma of the same flower is known as self pollination.
- ❖ Transfer of pollen grains from the anther of one flower to the stigma of another flower of the same kind is known as cross pollinations.

2. Explain the underground stems.

There are four types of underground stems. They are Rhizome, corm, tuber and bulb.

Rhizome:

- ❖ It is an underground thick stem with nodes and internodes.
- ❖ It grows horizontally and has an irregular shape.
- ❖ Rhizome have buds and give rise to new stem and leaves.
- ❖ **Eg:** Ginger, Turmeric.

Corm:

- ❖ This underground stem is round in shape and flat at the top and bottom.
- ❖ Daughter plants arise from their buds.
- ❖ **Eg:** Colocasia

Tuber:

- ❖ It is an enlarged spherical underground stem that stores food.
- ❖ It has many dormant buds on its surface known as 'eyes'.
- ❖ **Eg:** Potato

Bulb:

- ❖ It is condensed stem which is disc like and stores food in fleshy leaves.
- ❖ Bulb has two types of leaves: a) Fleshy leaves b) Scaly leaves
- ❖ **Eg:** Garlic and Onion.

VIII. Higher Order Questions.**1. Ginger is considered to be a stem, not a root. Why?**

Ginger is a modified stem and it is not a root. Because it stores food material, grows horizontally in soil. It has nodes and internodes.

2. What will happen if pollen grain of rose gets deposited on stigma of lily flower? Will pollen germination take place? Why?

- ❖ If pollen of rose gets deposited on stigmas of lily flower, then germination will not take place.
- ❖ Because flowering plants are able to pollinate other plants within the same species.

IX. Consider the following statements and choose the correct one.

- a) Assertion is incorrect, Reasoning is correct.
- b) Assertion is incorrect, Reasoning is incorrect.
- c) Assertion is correct, Reasoning is correct.
- d) Assertion is correct, Reasoning is incorrect.

- 1. Assertion :** Pollination and fertilization in flowers, produces fruits and seeds.
Reasoning : After fertilization the ovary becomes fruit and ovule becomes seed.

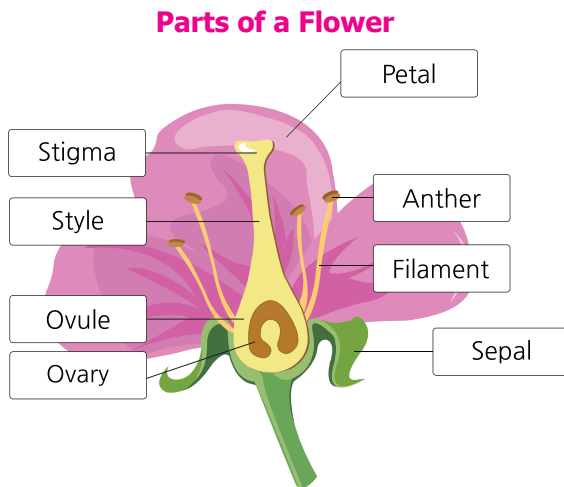
Ans: c) Assertion is correct, Reasoning is correct.

- 2. Assertion :** The example of conical root is carrot.
Reasoning : It is an adventitious root modification.

Ans: a) Assertion is incorrect, Reasoning is correct.

X. Picture Based question.

i. Label the parts below.

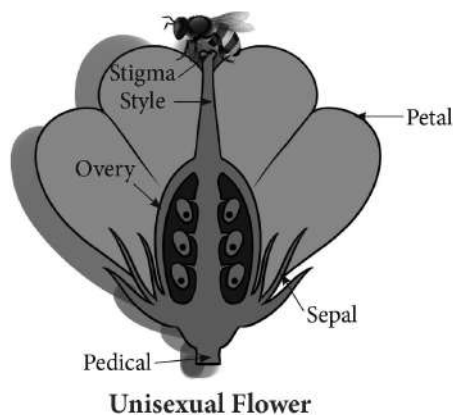
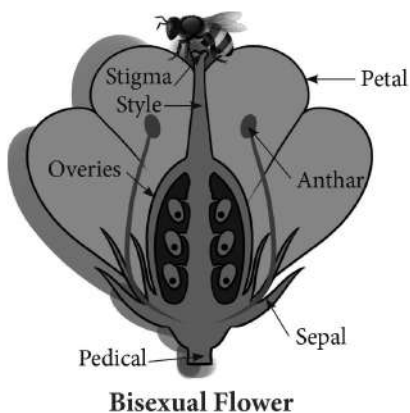


Stigma	Pistil	Filament	Ovule	Sepel	Stamen
Petal	Style	Anther	Ovary		

ii. Identify the four plants shown in the following table. Name the different modification in each of them.

S.No.	Name	Modification
1.	Garlic	Bulb
2.	Turnip	Tap root
3.	Rose plant	Spines
4.	Maize	Stilt root

Activity 3



Using the information from the above diagram complete the following table:

Sl. No.	Name of the flower	Complete / incomplete	Unisexual / bisexual	If unisexual male or female
1.	Hibiscus	Complete	Bisexual	Both male & female present in same flower
2.	Pumpkin	Incomplete	Unisexual	Male in separate single flower & female in separate single flower
3.	Rose	Complete	Bisexual	Both male & female present in same flower
4.	Coconut	Incomplete	Unisexual	Male in separate single flower & female in separate single flower
5.	Jasmine	Complete	Bisexual	Both male & female present in same flower

Additional Questions

I. Choose the appropriate answer.

1. A sexual reproduction in spirogyra is _____.

- a) Spore formation b) fragmentation
c) Pollination d) Budding

Ans: b) fragmentation

2. Sucking roots are seen in _____.

- a) betel b) avicenna
c) cuscuta d) banyan tree

Ans: c) cuscuta

3. Leaves are reduced to spines in _____.

- a) Opuntia b) Acacia
c) Peas d) Nepenthes

Ans: a) Opuntia

II. Fill in the blanks.

1. In cacti plants photo synthesis is performed by _____ part of the plant.

Ans: Stem

2. _____ the green part above the brinjal is of a flower.

Ans: Sepal

3. The slender tube like structure on the top of the ovary is _____.

Ans: Style

III. Analogy.

1. Spindle shaped root : radish : : Top shaped root : _____

Ans: beet root

2. Largest seed : double coconut : : Smallest seed : _____

Ans: Orchid

3. Unisexual flower : Papaya : : Bisexual flower : _____

Ans: Rose

IV. True (or) False, write the correct answer for the false statement.

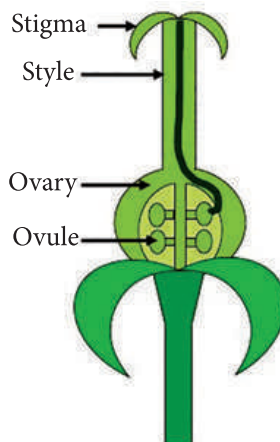
- In peas leaf tips are modified into tendrils. **Ans: False**
Correct Statement : In peas terminal leaflets are modified into tendrils.
- The spines appear on the casters are actually leaves. **Ans: True**
- Onion is an example for tuber. **Ans: False**
Correct Statement : Potato is an example for tuber.

IV. Match the following.

- | | | | |
|--------------------|---|---------------------|--|
| 1. Nepenthes | - | a) stolen | |
| 2. Opuntia | - | b) Self pollination | |
| 3. Wild strawberry | - | c) Prop root | |
| 4. Banyan tree | - | d) Traps | |
| 5. Tomato | - | e) Spines | |
- Ans: 1.d 2.e 3.a 4.c 5.b**

V. Short answer.**1. What is called modification in plants?**

In some plants root, stem and leaves change their shape and structure to perform special functions like storage of food, mechanical support, protection and other vital functions. This is known as modification.

2. Draw and label the structure of the female reproductive part Gynoecium.

Gynoecium – Female reproductive part

3. Mention the three types of modified roots for support with example.

- | | |
|-------------------|---------------------------------|
| 1. Prop roots | Eg: Banyan tree |
| 2. Slit roots | Eg: sugar cane, maize |
| 3. Climbing roots | Eg: Betel, black pepper. |

4. What are the different forms of modification of leaf? Give example.

- | | |
|-------------|----------------------|
| 1. Spines | Eg: Opuntia |
| 2. Tendrils | Eg: Pea |
| 3. Phyllode | Eg: Acacia |
| 4. Traps | Eg: Nepenthes |

5. What is called Fertilization?

After pollination, the fusion of male and female gametes takes place and zygote is formed. This is called fertilization.

VII. Answer in detail.

1. Differential between self pollination and cross pollination.

S.No.	Self pollination	Cross pollination
1.	Pollen grains are transferred from the anther to the stigma of the same flower or to another flower of the same plant.	Pollen grains are transferred from the anther of one flower to the stigma of another flower of the same kind or different plant.
2.	Plants do not need to produce pollen grain in a large quantity for self pollination.	Plants need to produce, pollen grains in larger quantities to increase the change of pollination.
3.	It does not produce changes in the characteristics of new plants.	It does introduce variations in characteristics of new plants.

2. Explain the different types of asexual reproduction in plants.

Asexual reproduction:

The production of new plants without the involvement of pollination and fertilization is known as asexual reproduction.

i) Vegetative propagation

- ❖ Vegetative parts of the plants such as root, stem and leaves can help to propagate the plants.
- ❖ In potato, shoot rises from eyes.

ii) Budding:

- ❖ Single yeast undergoes asymmetric division.
- ❖ It produces a small protuberance which gradually grows and detaches from the parent cell. This process is budding.

iii) Fragmentation:

- ❖ Spirogyra divides into pieces when it matures and each filament grows into an individual.
- ❖ This process is known as fragmentation.

iv) Spore formation:

- ❖ During unfavorable conditions non – flowering plants like algal, fungi moss and ferns produces spores.
- ❖ They germinate into new plants when favorable conditions return.



Formative Assessment - 5

Time: 15 mins.

Marks: 10

I. Choose the appropriate answer.

3×1=3

1. Reproductive part of a plant is _____.
a) Root b) Stem c) Leaf d) Flower
2. Sucking roots are seen in _____.
a) betel b) avicennia c) cuscuta d) banyan tree
3. Pollinations are _____.
a) wind b) water c) insect d) all the above

II. Fill in the blanks.

3×1=3

1. After fertilization the ovule becomes _____.
2. Onion and garlic are example of _____.
3. _____ are reduced to spines in opuntia.

III. State whether the following statements are True or False.

2×1=2

1. A complete flower has three whorls.
2. Ginger is an underground stem.

IV. Analogy.

2×1=2

1. Sucker : Chrysanthemum :: Offset : _____.
2. Prop root : Banyan tree :: Stilt root : _____.



Unit

6

Health and Hygiene

FIRST TERM

Evaluation

I. Choose the appropriate answer.

1. Ravi has sound mind and physically fit body. It refers to _____.

- a) hygiene
- c) cleanliness

- b) health
- d) wealth

Ans: b) health

2. Sleep is not only good for our body, but it is also good for _____.

- a) enjoyment
- c) mind

- b) relaxation
- d) environment

Ans: c) mind

3. Our living place should be _____.

- a) open
- c) clean

- b) closed
- d) unclean/untidy

Ans: c) clean

4. Tobacco chewing causes _____.

- a) anamia
- c) tuberculosis

- b) periodontitis
- d) pneumonia

Ans: b) periodontitis

5. The first aid is to _____.

- a) save money
- c) prevent the medical care

- b) prevent scars
- d) relieve the pain

Ans: d) relieve the pain

II. Fill in the blanks.

1. A group of people living together in a particular area is called _____.

Ans: Community

2. I am green colour box with garbage. Who am I? _____.

Ans: Bio degradable waste

3. Eyes are considered as _____ to the world.

Ans: windows

4. The hair follicles produce _____ which keeps the hair smooth.

Ans: oil

5. Tuberculosis is caused by the bacterium _____.

Ans: Mycobacterium tuberculae

III. State true or false. If false, correct the statement.

1. All food should be covered. True
2. Chicken pox also known as leucoderma. False
Correct Statement : Chicken pox also known as varicella.
3. Stomach ulcer is a non – communicable disease. True
4. Rabies is a fatal disease. True
5. First degree burns damage the whole skin. False

Correct Statement : First degree burns damage the outer layer of the skin.

IV. Match the following.

- | | | |
|-----------------|---|-------------------|
| 1. Rabies | - | a) Salmonella |
| 2. Cholera | - | b) Yellow Urine |
| 3. Tuberculosis | - | c) Cramps in legs |
| 4. Hepatitis | - | d) Hydrophobia |
| 5. Typhoid | - | e) Mycobacterium |

Ans: 1.d 2.c 3.e 4.b 5.a

V. Analogy.

1. First degree burn: epidermis :: second degree burn: _____. Ans: dermis
2. Typhoid : Bacteria :: Hepatitis : _____. Ans: Virus
3. Tuberculosis : air :: Cholera : _____. Ans: Water

VI. Consider the following statements and choose the correct option.

1. **Assertion (A) :** Oral hygiene is good.
Reason (R) : Sound teeth and healthy gums with healthy surrounding tissues.
 a) Both A and R are true. b) Both A and R are false.
 c) A is true but R is false. d) A is false but R is true.
Ans: a) Both A and R are true.
2. **Assertion (A) :** Chicken pox is a viral communicable disease.
Reason (R) : Characterized by rashes on the whole body, fever, head ache and tiredness.
 a) Both A and R are true. b) Both A and R are false.
 c) A is true but R is false. d) A is false but R is true.
Ans: a) Both A and R are true.

VII. Answer very briefly:**1. What is hygiene?**

Hygiene refers to the good habits and their practices which is followed to prevent diseases, maintain good health, especially through cleanliness.

2. Write about the right way of protect the eyes.

- ❖ Do not watch TV for a long time.
- ❖ Avoid rubbing eyes.
- ❖ Use cold water for cleaning eyes.
- ❖ Protect against chemicals.
- ❖ Get adequate sleep.

3. How to keep your hair clean and healthy?

- ❖ Rinse the hair well with clean water.
- ❖ Use good toothed comb.
- ❖ Use small amount of shampoo.
- ❖ Massage the shampoo into your scalp.
- ❖ Gently dry your hair with a towel.

4. Sobi frequently playing with her mobile. Suggest your to protect her eyes from irritation?

- ❖ Blink, blink and blink again.
- ❖ Minimize glare.
- ❖ Take breaks.
- ❖ Adjust your brightness.
- ❖ Hold your smart phone farther away.

5. Give any two communicable disease, which spreads in your locality during monsoon?

Cholera and Typhoid.

6. What first aid will you provide in the case of bruises?

- ❖ Ice the bruise with an ice pack wrapped in a towel.
- ❖ Leave it in place for 10 – 20 minutes.
- ❖ Repeat several times for a day.
- ❖ Compress the bruised area if it is swelling using an elastic bandage.

7. Ravi said "Ganga had minor burn, so I washed with water" Do you agree with his statement? Explain Why?

- ❖ Yes, I agree with his statement.
- ❖ For minor burns, the affected area should be washed with cold water and an antiseptic cream should be applied.

VIII. Answer briefly:**1. Why the first aid is essential?**

First aid is essential,

- ❖ To save the life.
- ❖ To prevent further bleeding and determine the condition of the patient.
- ❖ To relieve the pain.
- ❖ To provide a medical care available at the earliest.

2. What steps you will follow to keep the Teeth healthy?

- ❖ Brush your teeth two times a day.
- ❖ Floss between foods and drinks.
- ❖ Avoid sugary foods and drinks.
- ❖ Visit a dentist regularly for a check up and cleaning.

3. What this picture Explains?



It says that "Waste should not be thrown there".

4. Distinguish Communicable diseases and Non-communicable diseases.

S.No.	Communicable diseases	Non-communicable diseases
1	Communicable diseases spread one person to another.	Non communicable diseases do not spread from person to person.
2	They are caused by virus, bacteria and other germs through air, contaminated water & food.	They never causes by virus, bacteria or other germs.
3	Eg: cholera, typhoid.	Eg: heart attack, cancer.

5. Name the mode of transmission of communicable disease.

- ❖ Direct contact and indirect contact.
- ❖ Contaminated water, air and food.
- ❖ Vectors such as mosquito, and flies. Sharing of needles and blood transfusion.

6. Your friend says that her hair is thin, spares and lost very often. Suggested your ideas to reduce this problem.

- ❖ Enrich diet with protein.
- ❖ Scalp massage with essential oils.
- ❖ Wash your hair regularly with mild shampoo.
- ❖ Mild shampoo.
- ❖ Avoid brushing wet hair.
- ❖ Keep yourself hydrated.



IX. Answer in detail.

1. Write about any three Communicable diseases in detail.

1. Tuberculosis

- ❖ TB is caused by Mycobacterium tuberculae and spreads from one person to another person by spitting and prolonged contact with the spitting and prolonged contact with the patient.
- ❖ The symptoms are fever, weight loss, chronic cough and difficulty in breathing prevention and treatment.
- ❖ BCG vaccines.
- ❖ Giving special attention to the patients.
- ❖ Regular mediation like DOT.

2. Cholera

- ❖ Cholera is caused by vibrio cholera and spread through the consumption of contaminated food or water.
- ❖ The symptoms are vomiting, severe diarrhea and cramps in legs.
- ❖ Prevention and treatment.
- ❖ Good hygienic practices like washing hands before eating.
- ❖ Avoid eating uncovered food from street vendors.
- ❖ Drinking boiled water.
- ❖ Getting vaccination against cholera.

3. Typhoid

- ❖ Typhoid is caused by salmonella typhi and spreads by contaminated food and water.
- ❖ The symptoms are Anorexia, head ache, rashes on abdomen, dysentery and high fever upto 104° F.
- ❖ Prevention and Treatment.
- ❖ Drinking boiled clean water.
- ❖ Proper disposal of sewage.
- ❖ Vaccination.

2. List the situations in which first aid is given. What would you do if a person suffers from skin burns?

- ❖ First aid is the immediate treatment given to the victim of trauma or sudden illness before medical help is made available.
- ❖ In case of minor burns, the affected area should be washed with cold water and an antiseptic cream should be applied.
- ❖ In case of severe burns, where deeper layers of tissues get destroyed and blisters appear, use of water should be avoided.
- ❖ The burn area should be covered with a non – sticking cloth or bandages.
- ❖ Large burns need immediate medical attention.

3. How the disease are transmitted from one person to the other person?

Diseases caused by pathogens can be transmitted from one person to the other person directly or indirectly.

Contaminated food and water

- ❖ Communicable diseases can be transmitted through contaminated food and water.
- ❖ **Eg:** Cholera, Typhoid.

Air borne transmission

- ❖ Some infectious agents can travel long distances and remain suspended in the air.
- ❖ **Eg:** measles

Droplet Spread

- ❖ The spray of droplets during coughing and sneezing can spread an infectious disease. **Eg:** Cold.
- ❖ Diseases can be transmitted by contaminated food and water. **Eg:** Cholera, Typhoid
- ❖ Diseases can be transmitted through air by spitting and prolonged contact with the patient. **Eg:** Tuberculosis
- ❖ Diseases can be transmitted by sharing of needles and blood transfusion. **Eg:** Hepatitis.
- ❖ Diseases can be transmitted by the bite of the infected dog, rabbit, cat, monkey, etc. **Eg:** Rabies
- ❖ Diseases can be spread through vectors such as mosquito, flies etc. **Eg:** Malaria, Dengue.

X. Higher order thinking question.

A person is sleeping during day time. Why does this happen with some people that they feel sleepy during day time in office or in the classroom. Have you ever come across such situation? Explain.

- ❖ Day time sleepiness in the office or in the class room can be caused by sleep disorders.
- ❖ Sleep disorders may be narcolepsy or sleep apnea, a breaking problem that occurs during sleep.
- ❖ Day time sleep in office or class room may also caused by lack of exposure to sunlight.
- ❖ If the work is non stimulating and boring that will make a person to sleep at work in day time.



Additional Questions

I. Choose the appropriate answer.

1. Which of the following disease is caused by virus?

- a) cholera b) Typhoid
c) Tuberculosis d) Chicken pox

Ans: d) Chicken pox

2. _____ is a non communicable disease.

- a) Anaemia b) Hepatitis
c) Rabies d) Typhoid

Ans: a) Anaemia

3. _____ is a waterborne disease.

- a) Goiter b) heart attack
c) Cholera d) Stroke

Ans: c) Cholera

II. Fill in the blanks.

1. The Government of Tamilnadu provides _____ tablets to all the girls in schools.

Ans: iron folic

2. The act of chewing and tasting food is called _____.

Ans: mastication

3. Bleeding gums is caused by _____.

Ans: Vitamin C

III. True or False – If false give the correct statement.

1. Chickenpox can be prevented by BCG vaccination.

False

Correct Statement : Tuberculosis can be prevented by BCG vaccination.

2. Anaemia is caused by lack of iron.

True

3. Leucoderma is a communicable disease.

False

Correct Statement : Leucoderma is a noncommunicable disease.

IV. Match the following.

- | | | |
|----------------|---|--------------------------|
| 1. Cholera | - | a) moringa leaves |
| 2. Chicken pox | - | b) eyes in yellow colour |
| 3. Anaemia | - | c) bacteria |
| 4. Leucoderma | - | d) virus |
| 5. Hepatitis | - | e) loss of pigmentation |

Ans: 1.c 2.d 3.a 4.e 5.b

V. Analogy.

1. Bleeding gums : vitamin C : Night blindness : _____.
2. Cholera : Vibrio Cholearae :: Dengue : _____.
3. Tuberculosis : Communicable disease :: stroke : _____.

Ans: Vitamin A

Ans: Aedes Aegypti

Ans: Non communicable disease

VI. Short Answer.**1. What is personal hygiene?**

Personal hygiene is the branch of health which is concerned with the individuals adjustment to the physiological needs of the body and mind for the attainment of the maximum level of health.

2. Mention the measures to be adopted to maintain basic community hygiene.

- ❖ The surroundings should be kept clean.
- ❖ Drains should be covered properly.
- ❖ The domestic wastes should be segregated and properly disposed off.
- ❖ Used water from houses should not be let out into open areas.

3. What is a vaccine?

A vaccine is a biological preparation that provides active acquired immunity to a particular disease.

4. Define First aid.

First aid is the immediate care given to a patient before a medical person arrive.

5. What is health?

Health is a state of complete physical, mental and social well being and not merely the absence of disease or infirmity.

VII. Answer in detail.**1. Tabulate the diseases of eyes. Impacts and remedial measures.**

S.No.	Name of the Disease	Causative Agents	Impacts/ Consequences	Remedial measures
1.	Night Blindness	a lack of vitamin A, a disorder of the cells in your retina.	makes it hard to see well at night or in poor light.	Eat foods rich in antioxidant, vitamins and minerals.

2.	Conjunctivitis (Pink eye)	Caused by a virus and bacteria.	One or both eyes can be affected. Highly contagious; can be spread by contamination and sneezing.	Antibiotic eye drops or ointments, home remedy
3.	Color blindness	genetic condition.	❖ Difficulty distinguishing between colours. ❖ Inability to see shades or tones of the same colour.	There is no known cure for colour blindness. Contact lenses and glasses with filters.

Formative Assessment - 6

Time: 15 mins.

Marks: 10

I. Choose the appropriate answer.

3×1=3

- _____ is a non communicable disease.
 - Anaemia
 - Hepatitis
 - Rabies
 - Typhoid
- Our living place should be _____.
 - Open
 - Closed
 - Clean
 - Untidy
- _____ is a waterborne disease.
 - Rabies
 - Cholera
 - Chicken pox
 - Anaemia

II. Fill in the blanks.

3×1=3

- Eyes are considered as _____ to the world.
- Bleeding gums is caused by _____.
- Tuberculosis is caused by the bacteria _____.

III. State whether the following statements are True or False.

2×1=2

- Chicken pox is also known as Leucoderma.
- Rabies is a fatal disease.

IV. Analog.

2×1=2

- Cholera : Vibrio Cholerae :: Dengue : _____.
- Typhoid : Bacteria :: Hepatitis : _____.



Unit

7

Visual Communication

Evaluation

I. Choose the appropriate answer.

1. Which is the example for animation?

- a) sound communication
- b) visual communication
- c) vector communication
- d) raster communication

Ans: b) visual communication

2. Who uses the Photoshop software more?

- a) Teacher
- b) Doctor
- c) Painter
- d) Photographer

Ans: d) Photographer

3. Which option is used in the Microsoft Photostory to upload the photos?

- a) Begin a Story
- b) Import Pictures
- c) Settings
- d) View your Story

Ans: b) Import Pictures

4. Which technology shows the computer-drawn pictures as real picture?

- a) Inkscape
- b) Photo Story
- c) Virtual Reality
- d) Adobe Illustrator

Ans: c) Virtual Reality

5. Which technology uses pixels to create pictures?

- a) Vector
- b) Raster
- c) Both
- d) None

Ans: b) Raster

6. Which software is used to create symbols?

- a) Photoshop
- b) Illustrator
- c) Vector Graphics
- d) Photostory

Ans: c) Vector Graphics

II. Match the following.

- 1. Animations - a) 3D
- 2. Raster - b) Visual Communication
- 3. Vector - c) Pixels
- 4. Virtual Reality - d) Microsoft Photostory
- 5. Video Story - e) Illustrator

Ans: 1.b 2.c 3.e 4.a 5.d

III. Answer briefly:**1. What is Raster Graphics?**

- ❖ Raster graphics are created on the basis of PIXELS.
- ❖ The photos taken by camera and the photos scanned by a scanner are of the Raster type.
- ❖ When we enlarge this type of photos we could see the pictures as rectangular layers or grid.

2. Write notes on 2D and 3D pictures.

- ❖ The two dimensional (2D) Images have only the two dimensions – length and height.
- ❖ The three dimensional (3D) Images have three dimensions – Length, height and width.
- ❖ 3D images appear in front of our eyes like it happens in the real world.

3. Differentiate between Raster and Vector.

S.No.	Raster	Vector
1.	Raster pictures are created on the basis of PIXELS	Vector pictures are created on the basis of mathematics.
2.	When we enlarge this type of photos we could see the pictures as rectangular layers or grids.	When we enlarge this type of pictures its accuracy won't change.

4. With the help of Microsoft Photostory how will you create a video?

- ❖ To create a video with the help of the Microsoft photo story, we have to order the photos first.
- ❖ Then we have to select a music and keep in a file.

Additional Questions**I. Fill in the blanks.**

1. _____ is a good example for visual communication device.
2. _____ is a storage space that contains multiple files.
3. The software used by the photographers to edit photos is _____.

Ans: Cinema

Ans: Folder

Ans: Photoshop.

II. Answer briefly:**1. What is a file?**

The output we get from any application is commonly known as file.

2. What is called visual communication device?

The device which helps in explaining the concepts easily through pictures is known as visual communication device.

3. Write short notes on the new technology 'VIRTUAL REALITY'.

- ❖ VIRTUAL REALITY is a technology which shows the computer image as a real image.
- ❖ When we see games through this technology we can feel the settings of the game as real.

**Formative Assessment - 7**

Time: 15 mins.

Marks: 10

I. Choose the appropriate answer.**3×1=3**

1. Who uses the Photoshop software more?
a) Teacher b) Doctor c) Painter d) Photographer
2. Which technology shows the computer-drawn pictures as real picture?
a) Inkscape b) Photo Story c) Virtual Reality d) Adobe Illustrator
3. Which software is used to create symbols?
a) Photoshop b) Illustrator c) Vector Graphics d) Photostory

II. Fill in the blanks.**2×1=2**

1. _____ is a storage space that contains multiple files.
2. The software used by the photographers to edit photos is _____.

III. Match the following:**3×1=3**

1. Animations - a) Illustrator
2. Raster - b) Visual Communication
3. Vector - c) Pixels

IV. Answer briefly:**1×2=2**

Write notes on 2D and 3D pictures.

